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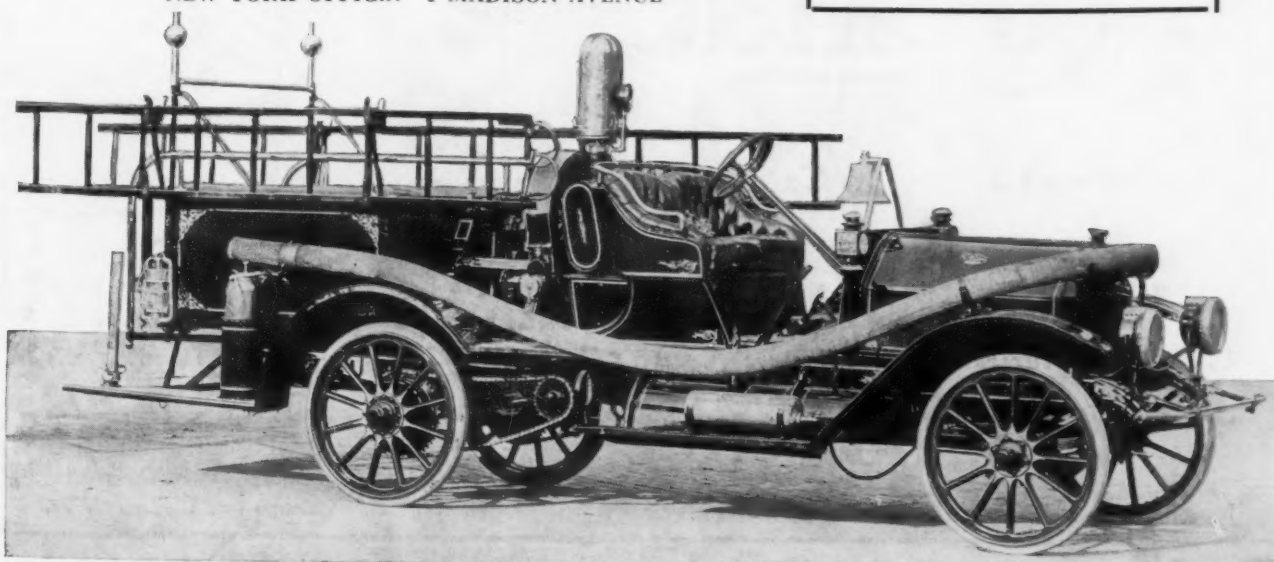
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MOTOR DUMP TRUCKS USED IN SPRINGFIELD'S STREET CLEANING.

STREET CLEANING BY MOTOR APPARATUS

Cost in Springfield, Ohio, Reduced One-Third in 1914—Motor Dump Truck and Motor Pick-Up Sweeper Used—Comparative Costs of Work by Horse-Drawn and by Motor Apparatus

By GEORGE L. RINKLIFF.

Since July of last year, the city of Springfield, Ohio, has been testing the practicability of the complete motorization of the street cleaning equipment used by that city.

For some time past there has been a general demand upon the part of the citizens of Springfield for a better developed system of street cleaning. In 1912, \$30,000 was expended by the city in street cleaning. In 1913, only \$25,000 was available for this purpose, with the result that during the last six weeks of the year street cleaning operations were practically suspended, excepting in the business section of the city, where the merchants took charge of affairs and paid by subscription for keeping the streets in a presentable condition during the holiday shopping season. In the appropriations for 1914, the city commission allowed a lump sum of \$25,000 for street cleaning purposes, including the purchase of new equipment. This amount proved sufficient to provide until the end of the year a service which is generally accepted as satisfactory, and in addition to purchase over \$6,000 worth of motor driven apparatus. The street cleaning operations include the handling of snow and leaves.

The improvement program of the city for the year 1914 called for new paving on six miles of streets, and a con-

siderable portion of this area was completed in time to require attention from the street cleaning forces during several months of the year. The cost of the year's operations, as shown by the report of city manager, Charles E. Ashburner, submitted to the city commission on November 2 and based upon the actual expenditures to October 1, plus the estimated expenditures for the remainder of the year, was as follows:

Labor (including foreman, laborers and teams)	\$17,477.16
Supplies	553.23
Maintenance of buildings	16.81
Maintenance of apparatus	163.34
Tools	68.01
Total	\$18,278.55

During the earlier part of the year three methods of street cleaning were used. The larger part of the area was swept once a week by horse drawn apparatus, two two-horse sweepers and a sprinkler being used for this purpose. Five two-horse wagons were required to haul away the sweepings. A smaller area was flushed each night, or on alternating nights, according to the amount of travel over each street. The center of the city received the attention of white wings.

After going over the details of the street cleaning problem, Mr. Ashburner reached the opinion that the opportunity for reducing the operating cost lay in the motorization of equipment. Authority was secured from the city commission for the purchase of a motor-driven dump truck of three tons capacity, and a motor-driven pick-up street sweeper. These pieces of equipment were installed in July, and it was found that the use of the motor truck eliminated the necessity for hiring teams to remove the street sweepings. Previous to the purchase of the truck, an experiment was made in the use of this type of apparatus in cleaning up rubbish from alleys, with satisfactory results.

An Elgin pick-up sweeper was installed, and several weeks were devoted to experimenting with it in the effort to ascertain the best system of operation under the conditions encountered in Springfield.

The machine requires one operator, and after the devising of an operating schedule which gives high efficiency, the area swept daily, on an eight hour schedule, runs between 110,000 and 120,000 square yards. Two laborers are required for sweeping out the corners of the gutters and such places as cannot be covered by the sweeper. The machine will clean within from eight to ten inches of the curb. It cleans an eight-foot swath, and the sweepings are thrown forward by the broom into an elevator which deposits them in a bin in front of the machine, from which they are dumped at points convenient for the motor truck. A 180-gallon water tank is carried on the sweeper, from which water is forced under air pressure through atomizers placed directly in front of the broom, to keep down the dust. The streets covered by the sweeper are swept twice a week, the heaviness of the traffic over them and their proximity to gravel streets making this necessary.

The following tabulation shows the comparative cost per 8-hour day of operating horse-drawn and motor-drawn apparatus for street sweeping in Springfield.

Horse-Drawn Apparatus.	
1 team and driver on sprinkler.....	\$4.00
2 teams and drivers on sweepers.....	8.00
3 laborers at \$2.00.....	6.00
	<hr/> \$18.00
Motor-Driven Apparatus.	
Operator	\$3.00
2 laborers at \$2.00.....	4.00
Gasoline and oil.....	1.50
	<hr/> \$8.50

In the removal of sweepings, a thirty horsepower three-ton Kelly-Springfield dump truck is used. One operator and four laborers are required to handle the work assigned to this portion of the organization. All street sweepings, whether collected by the motor sweeper or other parts of the organization, are handled by this truck, and experience has shown that the chauffeur can be utilized as a sub-foreman. In parts of the city where the condition of the streets requires the use of a white wing squad or of horse-drawn sweeping apparatus, and where the sweepings are collected either in cans or gathered in small piles in the

gutters, the motor truck moves along the streets slowly, and the laborers can easily load the sweepings without making it necessary to stop the truck. This reduces the waste of time to a minimum, as does also the speed at which the truck can run to the dumping ground, unload and return for another load.

In dumping its load, the front end of the truck is elevated by means of a hydraulic hoist, which has worked satisfactorily. The sides of the bed are low enough to enable a man to shovel into it from the ground conveniently.

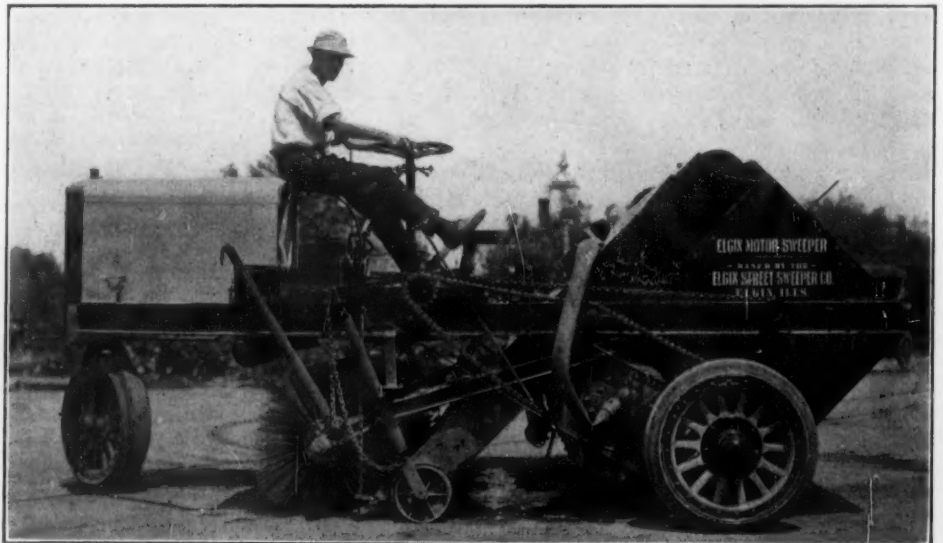
The following tabulation shows a comparison of the daily operating costs of removing sweepings with horse-drawn and motor-driven apparatus in Springfield:

Horse-Drawn Apparatus.	
5 teams and drivers at \$4.00.....	\$20.00
5 laborers, at \$2.00.....	10.00
	<hr/> \$30.00
Motor-Driven Apparatus.	
Chauffeur	\$3.00
4 laborers, at \$2.00.....	8.00
Gasoline and oil.....	1.50
	<hr/> \$12.50

Experience to date seems to warrant the fairness of assuming that still further savings can be effected in street cleaning operations. The finances of the city have not permitted the carrying out of a policy which was recently given favorable consideration at a conference of all department heads of the city government with city manager Ashburner, by which the departments would maintain on a co-operative basis a repair shop for the property owned by the city. It is believed that by this the maintenance cost of apparatus would be reduced. At present the gasoline used by the motor-driven apparatus in the service department costs one cent more a gallon than it would if the department possessed a storage tank of its own.

LIABILITY FOR FIRE.

It is reported that Mayor Curley, of Boston, Mass., is to ask the next legislature to pass a bill giving that city the powers which New York has to hold owners liable for fires in their buildings, as described in our issue of December 17. He would impose a fine of \$50 on occupants of buildings who failed to close hoistways, well-holes, trapdoors and iron shutters at the completion of business each day; and make them liable for any injuries.



SPRINGFIELD'S PICK-UP SWEEPER.

resulting from such failure, to any officer or employee of the fire department, to the extent of \$1,000 or more, or \$5,000 or more in case of death. The provision of the New York charter as to payment to the fire department of the cost of extinguishing fires is adopted with little change in the proposed Boston bill.

STREET CLEANING IN CHICAGO.

Chicago is divided into thirty-five wards, each having a superintendent in charge of street cleaning, ash and rubbish collection and garbage removal. All streets are cleaned by the block system, except a few with poor waterbound macadam or cedar block pavements (comprising about thirty-five miles in the outlying parts of the city), which are cleaned about four times a year.

A schedule is prepared for each ward to be used in the assignment of street sweepers. This schedule gives the length and frequency of cleaning each street assigned to a sweeper, the length being in accordance with definite areas established as a standard day's work for cleaning each kind and class of pavement. The frontage and traffic conditions are the main factors which determine the frequency of cleaning required on each street in order that all may be maintained at all times in a uniformly clean conditions. The frequency of cleaning, therefore, is the variable factor used in laying out sections on the same kind of pavements; thus, a very heavy traffic street will receive two cleanings per day, while a street having less traffic will receive one cleaning per day. Daily cleaning is given on a street having a built-up frontage and a traffic of 350 to 400 teams a day. The length of a section assigned as requiring two cleanings is one-half of that assigned on the basis of one cleaning.

The standard areas assigned to sweepers to be cleaned once a day are as follows:

Asphalt in good condition.....	21,500	sq. yds.
Creosoted block in good condition.....	21,500	" "
Brick in good condition.....	16,500	" "
Granite in good condition.....	13,400	" "

The pavements are further classified according to their condition, and the above areas reduced accordingly if the condition is such as to make the cleaning more difficult. In order to maintain the above yardage in good condition, it is necessary that the sweeper use his tools properly and handle his work systematically. Very satisfactory results are being obtained by the assignment of men on the above basis.

During the past few years all waterbound macadam pavement has been given a coat of heavy oil, with the result that the surface is now suitable for regular cleaning once to three times per week.

The city employs an average of 475 men per day on traction streets in winter, not including those employed on account of snow, doing such work as weather conditions permit; 150 of these being employed in the loop district.

Sidewalks are flushed at night by attaching hose to a regular power flushing wagon. During the present year 5,500,000 square yards were flushed in this way, in addition to which 18,500,000 square yards of sidewalk were swept. Flushing by use of an auto flushing machine has been employed this year in cleaning about 150,000 square yards, and three additional machines of this kind are to be used in 1915.

The regular summer cleaning consists of approximately 220 working days, and during this time an average of 840 men are employed, 157 teams and 74 flushers. This number is reduced in the winter to about 475, as stated above.

Laborers and foremen who wear uniforms receive 10 cents per day additional pay for maintenance of the uniforms.

The following table shows the length of streets cleaned at each number of cleanings per day:

Table Showing Service and Length of Streets Cleaned.

Service expressed by relative number of cleanings per day	Traction length in miles	Non-Traction length in miles	Total length in miles
10 .....	....	0.41	0.41
8 .....	....	0.14	0.14
7 .....	....	0.27	0.27
6	2.62	0.43	3.05
5	5.32	0.59	5.91
4	1.11	2.04	3.15
3	1.20	2.36	3.56
2½	7.00	2.42	9.42
2	13.75	10.15	23.90
1½	96.55	30.60	127.15
1	185.50	307.50	493.00
3 per wk.....	23.30	288.00	311.30
2 per wk.....	4.22	216.50	220.72
1 per wk.....	5.28	305.50	310.78
Total	345.85	1166.91	1512.76

For the above information we are indebted to F. H. Canfield, efficiency engineer of the Chicago Civil Service Commission.

COLLECTING ASHES AND GARBAGE IN PASSAIC.

By ARTHUR REID.*

The city of Passaic, N. J., has a population of 68,000 according to the last census taken. During the year of 1910 the city started to collect ashes and garbage, under the supervision of the Street Department. Previous to this time the collection of ashes and garbage was done by a private concern under contract. During the first year of city collection, under the mayor and council, the total cost was \$22,000; the population then being 58,000. In 1911 the form of government was changed from the form of mayor and council to commission government, according to the Walsh Act. Under commission government the cost of collecting ashes and garbage was reduced to \$13,500 for 1911-1912, a decrease in one year of \$8,500, although the population was increased by 2,000. During the year of 1912-1913 the cost was \$14,500, and for the year of 1914-1915 an appropriation of \$16,000 was allowed the Department of Streets and Public Improvements for the collection of ashes and garbage. This is a decrease of \$6,000 from 1910-1911, while the population increased 10,000.

Under the method of contracting for the removal of ashes and garbage, the city was unevenly divided into three sections, regardless of population and other conditions which should receive consideration. Each section was collected twice a week. This made collections in the more thickly populated sections hard on both men and horses, inconvenienced the inhabitants and endangered health. Under the present method the city has been rearranged into sections according to the population of each. In the business section and the thickly settled sections of the city collections are made every day.

At present there are six wagons in use. Each wagon delivers each day seven loads weighing from 6,500 lbs. to 7,000 lbs. each, including the weight of wagon and driver. (Under the old system some wagons would deliver eight loads, of varying weights, per day; while others would deliver four, five or six loads.) There are therefore forty-two loads delivered to the dumping grounds per day. Each wagon thus has its own amount of work to do each day, which consists of ten working hours.

The department is made up of a foreman, who keeps the time, investigates complaints, etc.; a stableman, who takes care of the horses, wagons and stables during the day; a

*Superintendent of Streets of Passaic, N. J.

watchman, who takes care of the stables, etc., during the night; twelve laborers, who drive the wagons and empty the barrels into them; fourteen horses and eight wagons. During the warm weather, when the amounts collected are small, only six wagons are used; but in the winter months, when the collection is very heavy, nineteen men and eight or nine wagons are required. All the wagons used have drop bottoms. Formerly only one dumping ground was used, which necessitated a great loss of time in hauling from the west side of the city to the east side, where the dumping grounds were situated, a distance of one to one and three-quarter miles. Now there are two dumping grounds, one on the east side and one on the west side. This saves much time and is much easier on the horses.

In placing the refuse on the streets for collections the ashes are not separated from the garbage. This question was given careful consideration, but it was difficult to get the people, especially in the poorer sections, to separate them, so this was abandoned. When the mixed ashes and garbage is delivered to the dumps the waste paper, rags, old rubber shoes, bottles, etc., are picked out. The privilege of picking is given to a concern that deals in junk, etc. After all the waste is picked out the refuse is spread and each day is covered with sand, dirt or clay so as to prevent the spreading of disease germs and unpleasant odors.

During the severe snow storms of February and March, 1914, the Garbage Department of this city was only four hours behind in their collections. Reports from other cities the same size as this, and some much larger, were that they were three and four days—some of them a week—behind in their collections. This seems to indicate that the city is divided up evenly, which is of the greatest importance.

Under the present system there are practically no complaints of drivers being impudent to residents, mistreating horses, breaking receptacles, etc., as was the case when the work was done by contract, as the men are employed directly by the city and no impudence or mistreatment to the horses is tolerated. Comparing the two systems, the citizens of Passaic agree that collection by city forces gives much more satisfaction than when done by contract.

COURSES IN HIGHWAY ENGINEERING.

Most of the engineering schools are now running courses, long or short or both, in highway engineering, several of which have already been noticed in these columns. The latest notices we have received are from the Case School of Applied Science at Cleveland, Ohio, and concerning a course in bituminous materials, surfaces and pavements at Columbia University, New York City.

The course at the Case School is to be given from January 18 to January 26, and will be free to engineers, contractors, inspectors and any others interested in highway engineering. The aim is to offer a complete resume of past road building practice, with frequent laboratory demonstrations of material. Among the speakers will be Will P. Blair, Professors R. H. Danforth, F. H. Neff, C. T. Olmstead, M. B. Greenough of the Case School, Dalton Moomaw, road engineer of Cuyahoga County, and W. A. Stinchcomb, county engineer of that county. Circulars announcing details of this course can be obtained from Mr. Greenough, instructor in charge of highway engineering at the Case School.

The course in Columbia University will be given in fifteen periods of two and a half hours each on Tuesday and Thursday evenings, beginning January 26 and ending March 16, between 7:30 and 10 p. m. For this course

there is a registration fee of \$5 and an instruction fee of \$20. Instruction will be given by Professors A. H. Blanchard and H. B. Drowne, Prevost Hubbard and F. P. Smith. Further information can be obtained from Professor Blanchard at Columbia University.

GARBAGE COLLECTION IN A SMALL CITY.

By L. J. WERTHEIM.*

Systematic municipal garbage collection was begun in Berlin, N. H., August 1, 1913, the regular collection accommodating about twelve thousand people and being made once each week in the residential sections and three times in the business sections. A regular schedule of collection is followed and the tenants are required to place a tight, covered steel or iron can containing their refuse upon the sidewalk, where the cans are left by the driver after collection. Wet garbage is required to be drained and wrapped in paper. No ashes are taken by the regular collectors but are taken and used for street filling by the Public Works Department, no account being kept.

Private individuals keeping hogs outside the city limits are allowed to collect kitchen refuse provided their cans are clean, waterproof and covered.

The municipal collection is handled by the Public Works Department but is under the inspection of the health officer, who also keeps graphic reports of the number of loads and amount of garbage collected. The garbage is disposed of by dumping in a fill which is being made for playground purposes. It is here burned and then covered with cinders, of which the fill is principally made.

We use a Holzbog sanitary steel wagon drawn by one horse. This is a tight, covered wagon of 47 cu. ft. capacity weighing about 1,700 pounds. The garbage weighs on an average 1,000 pounds to the load.

During the first twelve months of operation, from Aug. 1, 1913, to July 31, 1914, a total of 1,911 loads of garbage



LOADING BERLIN GARBAGE CART.



DUMPING POSITION OF CART.

was collected, varying from a minimum of 131 during November to a maximum of 202 in June; an average of a little more than six loads per working day. The aver-

*City Engineer Commissioner of Berlin, N. H.

age weight of a load is taken at one-half ton and the average volume at 1.74 cubic yards.

The cost for the twelve months was \$1,638 for team and labor, \$15 for incidentals and \$46.50 for interest and depreciation, a total of \$1,699.50. This gives 88.9 cents per load, or \$1.78 per ton. The cost is also about 14 cents per year per capita of population served. The expenses are \$3.25 per day for a horse and driver and \$2.00 for a helper, each working 8 hours.

STREET CLEANING DATA

From Thirty-One Cities—Average Amount of Sweepings Per Unit Area—Cost Per Unit Area and Per Unit Volume of Sweepings

In our issue of December 10 we published tables giving data concerning street cleaning methods, costs, etc., in several score of cities. The figures published were confined to those received from the cities, condensed as much as possible; but where these were at all complete, interesting deductions are possible from a comparison of the various items. For instance, if the total area of cleaning done be divided by the total area subject to cleaning, we obtain the average number of cleanings of this entire area during the year. Again, if the total cubic yards of sweepings collected during the year be divided by the area subject to cleaning, we find the amount of sweepings taken off of each unit area during the year; and similarly we can learn the amount of sweepings removed from each unit area at each cleaning by dividing the total amount of sweepings by the total amount of cleaning done. These calculations we have made for thirty-one cities, and give in the accompanying table. The unit of "area subject to cleaning" which has been used is one thousand square yards, and the unit of "total cleaning done" has been taken as one million square yards, in order to avoid large decimals. Calculations were also made of the cost of cleaning done per thousand square yards and also per cubic yard of sweepings collected.

In selecting cities for this calculation it was necessary, of course, to take those which furnished sufficient data, and only thirty-eight such were found. Of these, moreover, seven were found to contain statements which appeared to give such improbable results that they were omitted, although it is possible that the statements given were in reality correct but the conditions were unusual. In this connection it may be said that it should be recognized that very few cities collect or classify data of this kind in such a way as to make the comparison of work in the several cities by any means an accurate one. The report of total area of cleaning done in many cases was apparently merely a multiplication of the area by the approximate number of days during which cleaning was carried on. The cubic yards of sweepings was in many cases a product of the number of days the wagons collecting such sweepings were employed, the number of wagons, number of trips each was supposed to make per day, and the average capacity of each—an assumption that every wagon carries a full load at every trip. Again, the cost given in some cases includes only the wages of labor and teams, while in other cases it includes overhead expenses, an allowance for depreciation and interest on wagons and other appliances, etc.

With all these variations among each other, however, there can be seen a more or less general agreement, and in a number of cases the reasons for variations between individual cities can be readily imagined. For instance, Washington, D. C., showed the smallest amount of sweepings per thousand square yards of any of the larger cities, which is readily accounted for by the much larger street area and the fact that there is probably a less amount of hauling of structural materials than in most of the others. There might appear to be some reason for separating the larger from the smaller cities into groups, but an inspection of their respective figures does not indicate that there is any general relation between size of city and number of cleanings, amount of sweepings collected, or cost of work.

Referring to the table, we find that the average number of cleanings per year is 156, varying from 37½ to 300.

Average Quantities and Costs per Unit. Thirty-one Cities.

City. (Arranged in order of "area subject to cleaning.")	Number of cleanings.	Cu. yds. of sweepings per sq. yds. sub. to cleaning	Cu. yds. sweep- ings per 1,000- 000 sq. yds. of cleaning done.	Cost per 1,000 sq. yds. of clean- ing done.	Cost per cu. yd. of sweepings.	Methods of cleaning.*
Chicago, Ill.	183	27.3	149.5	\$0.267†	\$1.78†	A, B, D
Philadelphia, Pa.	148	23.1	156	.672†	4.33†	A, B, C, D
Baltimore, Md.	124	31.1	250	.405‡	1.62‡	A, B, C, E
Pittsburgh, Pa.	152	14.4	94	.297‡	3.15‡	A, B, C
Washington, D. C.	166	12.2	73.5	.643‡	8.75‡	A, B, D, E
New Orleans, La.	60	14.4	241	1.53 †	6.35 †	A, C, D
Newark, N. J.	134	24.5	182	.357‡	1.96‡	A, B
Boston, Mass.	109	48.0	440	1.285**	2.92**	A, B, D
Tacoma, Wash.	83	6.8	82.5	.207††	2.53††	A, B, D
Youngstown, O.	40	15.1	373	.512††	1.36††	A, D
Houston, Tex.	200	37.8	189	.194**	1.03**	A, B, C
Lincoln, Neb.	37.5	6.5	175	...	...	A, B
Cambridge, Mass.	...	25.0	...	.314§§	1.76§	A, B, E
Oakland, Cal.	219	...	...	...	...	A, B
Savannah, Ga.	182	25.9	143	.248§	1.74§	A, B, E
Norfolk, Va.	217	26.3	121	.309†	2.57†	A, B, E
Long Beach, Cal.	...	6.7	...	...	2.65††	A
Mobile, Ala.	...	17.8	...	...	2.50§§	A, B
Danville, Va.	50	16.2	323	.358§§	1.11§§	B
Boise, Ida.	132	...	...	.328†	...	B
York, Pa.	300	...	...	.169†	...	A, D
Phoenix, Ariz.	101	37.0	360	.79§	2.17§	A, B, E
Greenville, S. C.	156	8.6	55	.167††	3.04††	B, D
Virginia, Minn.	144	...	...	.456‡	...	A, B, D
Norwalk, Conn.	226	...	...	.17††	...	A, B, D
Lake Charles, La.	203	41.9	220	...	...	B
Morristown, N. J.	234	7.5	32	...	...	A
Clinton, Mass.	192	...	...	.139††	...	A, B, C
Gadsden, Ala.	...	...	167	...	...	A
Medford, Mass.	...	7.5	...	...	...	A, B
Fort Smith, Ark.	...	12.3	...	...	.79††	A, B
Averages	156	20.5	191	.355	2.70	

*A—hand broom. B—horse or motor broom. C—flushing by hose. D—flushing by machine. E—squeegee. †Includes supervision, labor, renewals and supplies. ‡Includes supervision and labor. §Includes supervision, labor, renewals, supplies, interest and depreciation. **Supervision, labor, renewals, supplies and depreciation. ††Supervision, labor and supplies. §§Total expenditure, probably does not include interest or depreciation. ‡‡Labor and supplies.

(One of the cities not included in the table reported only 2.3 cleanings, which we imagine was due to including in the calculations a large street area which was cleaned only once or twice a year.) All of the larger cities down to and including Washington approximate quite closely to this average which is equivalent to exactly three times a week. The cubic yards of sweepings per year per thousand square yards of street area was found to average 20.5, varying from 6.7 to 48.0, the latter being in Boston and being nearly four times that reported from Washington, both figures being apparently quite reliable and accurate. There does not appear to be any relation between the number of cleanings per year and the total amount of material removed. While it would seem probable that there is such relation, it is obscured by other conditions and by inaccuracies of the figures. A plotting of the figures, however, shows a general approximation to the formula: cu. yds. of sweepings = $7 + (1-10 \text{ the number of cleanings per year})$. The average amount of sweepings collected at each cleaning was 191 cubic yards per million square yards of cleaning, varying from 32 to 440, Boston again having the highest amount. This shows a very considerable variation; but again we find an approximation to a formula: cu. yds. of sweepings = $325 - (\text{number of cleanings per year})$.

The cost per thousand square yards of cleaning done averaged $35\frac{1}{2}$ cents, varying from 14 cents to 1.53. (Of the cities not included in this table, one reported a cost of less than 2 cents and another of more than \$6.50.) Here we notice, among the larger cities at least, a slight relation between the cost of cleaning a square yard and the amount of sweepings removed from it.

The cost per cubic yard of sweepings averaged \$2.70, varying from 79 cents to \$8.75. Here again we trace a certain but quite indefinite relation between the cost per cubic yard of sweepings and the number of cubic yards collected, the larger amount being to some extent accompanied by a lower cost, as might be expected.

The wide divergence of quantities and costs reported might seem to be disappointing, but to those who have endeavored to obtain similar information in the past, there is considerable encouragement to be found in the fact that so many cities are able to furnish any figures at all which can be classified and compared. Moreover, considering the very backward condition of street cleaning in a great many cities and the progress and application of scientific methods which are found in others, it would naturally be expected that there would really be almost as great variations as these figures indicate.

There still remains a great deal to be done, however, especially in the way of establishing well defined units for comparison, and perhaps even more in the collecting of accurate figures concerning operations. The latter must generally be obtained from daily reports of street foremen, checked by inspectors (or the superintendent himself, in small cities); these to be further cross checked by an office assistant and combined and classified in accordance with well worked out and standard methods.

When this is done, not only will it be possible to compare amounts of work done per day of labor and the cost per unit for each kind of service rendered, but budgets for future work can be prepared based on a more or less exact knowledge of what effect will be produced on expenditures by the addition of new areas to the street cleaning schedule, the transfer of areas from infrequent to frequent cleaning, etc. At present perhaps the most common method is to obtain as large an appropriation in the budget as possible and spend it all, striving for as good results as our limited knowledge of the subject and political influences will permit.

CINCINNATI STREET CLEANING

Accounting System Installed in 1912—Monthly Reports Giving Unit Labor and Overhead Costs—Methods of Cleaning Used

By means of the accounting system installed in the latter part of 1912, the work of the Cincinnati, Ohio, Street Cleaning Department has been made more efficient than ever before, notwithstanding the many obstacles such as floods, heavy snow and the ice strike. This system has absolute book control over all supplies. For instance, under the present system of stable reports it is possible to know exactly how many pounds of each kind of feed each horse consumes day by day, the total per month and the value in dollars and cents of such feed. By this method direct comparisons between stables can be made and any stable feeding above the average is made the subject of investigation. Since there are twenty stables in the city, the importance and saving of the system is plain.

Monthly reports are submitted showing costs of various street cleaning operations, not only of the labor unit costs, but also of overhead charges, thereby making possible accurate unit costs of all street cleaning work, repairs and stable charges. Horse efficiency reports also are made monthly, showing the numbers and percentages of horses working and not working and giving accurate details of horses on applied work in the street cleaning operations.

Reports are submitted every day by foremen showing work done by the employees. This enables figures to be made periodically of the exact labor costs of the various operations such as flushing, white wing work, ash and mud collection and hand brooming. By this means the superintendent can ascertain the relative costs of work done in the various districts and is able to make comparisons month by month of the men in the same district and can also compare the same classes of work in one district with those in another.

Owing to the fact that practically no cost records were kept in former years, it is impossible to compare the work of last year with that of any previous year. However, the methods adopted will enable comparative tables to be made year by year if the system is used permanently. By this method the expenditures are classified through a wide distribution and a close analysis of all working conditions and charges is now possible.

There are 608.1 miles of street subject to regular street cleaning, the total area being 9,959,328 square yards. This includes 744,896 yards of sheet asphalt; 1,760,368 yards of granite block; 680,013 yards of cobble; 1,042,213 yards of brick; 294,402 yards of wood block; 31,054 yards of limestone; 181,421 yards of bitulithic; 5,049,940 yards of macadam; 149,174 yards of Tarvia and 25,857 yards which are classified as miscellaneous. The total area cleaned during the year was 418,340,354 square yards and 128,030 cubic yards of street sweepings were collected, an average of about .306 cubic yard to the 1,000 square yards. The sweepings are estimated according to the capacity of the wagons in which they are hauled and the number of loads.

Various methods of cleaning are used, including hand broom, which is employed on granite, asphalt, brick and cobble; horse sweeper for cobble and macadam; horse machine flusher for granite, asphalt and brick; white wings on the granite and asphalt in the business sections, and sprinkling on the macadam in the suburbs. The force includes 367 men, of whom 66 have supervisory and clerical duties. There are 118 employed on the hand broom, 3 on horse sweepers, 29 on flushing, one on sprinkling and 78

on white wing work. The men are paid \$2 and \$2.25 per day and, as a rule, work 8 hours per day, not including Sundays and holidays. A few men are employed on Saturday nights to clean the markets.

The entire work is done by the city under the direction of William Marcheuser, superintendent of the street cleaning department. All cleaning, garbage collection

and other like work are under the charge of this department, which also takes care of the sewers and cleans the catch basins. During the year 3,076 catch basins, 26,851 inlets and 713 sewers were cleaned, at a total cost of \$33,183.69, of which \$12,917.90 was overhead and \$20,265.79 was labor. In this work 16,896 cubic yards of material were removed, and 6,092 horse-days were required.

Department of Street, Sewer and Catch Basin Cleaning—Expenses for 1913.

	Admin- istration	Stable	Street Cleaning	Repairs	Sewers & C.B.	Dog Pound	Flood Relief	Ice Relief	Totals
Personal service.....	\$11,339.20	\$22,596.50	\$269,294.28	\$15,836.89	\$23,831.11	\$1,419.50	\$336.56	\$170.06	\$344,824.10
Transportation	332.85	30.60	.....	.....	.....	.....	.....	.....	363.45
Communication	675.21	.....	.....	.....	2.55	.....	.....	.....	677.76
Special contract service..	126.24	6,165.71	.75	1,367.45	4.25	49.81	.....	.....	7,714.21
Supplies and materials...	519.68	42,441.55	23.30	6,400.36	157.20	110.26	4.71	.....	49,657.06
Replacement and equipm't	152.95	1,429.19	2,557.28	68.97	457.26	32.94	.....	.....	4,698.59
Fixed charges .....	.....	2,279.60	654.00	.....	.....	.....	.....	.....	2,933.60
Total.....	\$13,146.13	\$74,943.15	\$272,529.61	\$23,673.67	\$24,452.37	\$1,612.51	\$341.27	\$170.06	\$410,868.77

Statement Showing Cost of Operation, Units, Unit Costs, and Overhead.

Work	Units	No. of units	Horse days	Labor per unit	Cost per unit with overhead	Labor cost	Cost overhead	Total
Flushing	Squares	71,334	9,902	\$.176	\$.369	\$12,552.85	\$13,785.86	\$26,338.71
Machine brooming	"	2,950	256	.091	.235	282.34	411.83	694.17
Street sweeping	Cu. yds.	128,030	17,662	.278	.496	35,646.73	27,857.63	63,499.36
Ash removal	"	306,423	36,538	.293	.478	86,719.42	59,620.36	46,339.78
Gutters	Squares	2,035	.....	.263	.293	536.00	61.16	597.16
Bridges	"	1,960	.....	.395	.441	773.37	91.01	864.38
Steps	"	1,280	.....	.398	.441	509.00	55.98	564.98
Weeds	"	2,419	.....	.214	.389	816.96	124.07	941.98
Alleys	"	14,907	.....	.086	.096	1,275.00	160.71	1,435.71
Crossings .....	"	.....	.....	.....	.....	645.00	75.91	720.91
Snow removal	"	12,929	585	.251	.351	3,238.74	1,299.07	4,537.81
Ice removal	Cu. yds	834	72	.429	.615	358.33	154.95	513.28
White Wings	Squares	162,319	.....	.263	.301	42,635.25	6,279.51	48,914.76
Broom gang	"	67,988	.....	.467	.526	31,683.33	4,979.52	36,662.85
Gutters	"	17,470	.....	.295	.326	5,082.88	609.88	5,967.76
Gutters after flushing	"	35,190	.....	.290	.324	10,209.88	1,194.18	11,404.06
Suburban .....	"	.....	864	.....	.....	2,897.86	1,417.51	4,315.37
Slides	"	1,078	85	.464	.576	480.69	161.58	642.27
Flood .....	"	.....	2,326	.....	.....	9,690.29	3,850.31	13,540.60
Hartwell .....	"	.....	624	.....	.....	840.00	716.03	1,556.03
Dog Pound .....	"	.....	161	.....	.....	1,419.50	461.61	1,881.11
Fernbank .....	"	.....	.....	.....	.....	260.04	75.40	335.44

Horse Efficiency Report.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Horse days applied.....	5,594	5,169	5,873	6,896	6,916	6,198	6,643	6,755	6,484	7,119	5,745	5,853
Horse days unapplied....	2,015	1,595	1,458	271	309	919	828	574	473	440	1,010	1,405
Sundays	1,160	1,172	1,430	1,116	1,434	1,485	1,485	1,445	1,455	1,166	1,758	1,470
Buggy horses.....	248	224	248	300	310	300	300	300	300	310	300	372
	9,017	8,160	9,009	8,583	8,959	8,902	9,256	9,074	8,712	9,037	8,813	9,100
Average idle work horses per day (excluding Sun- days)	74-2/3	66-1/2	56	10-2/5	11-1/2	36.7	31.5	20.5	18.9	16.3	42.1	54.0
Average days each work horse idle (excluding Sundays)	7	5-1/2	5.1	1	1	3-1/5	2.9/10	2.1/10	1.7	1.5	3.6	4.9
Cost of feed per horse day (all horses) .....	.355	.325	.313	.320	.348	.343	.337	.382	.384	.443	.381	.381
Other stable expense per horse day (all horses).	.265	.366	.244	.384	.343	.396	.333	.278	.396	.296	.284	.399
Total stable cost per horse day (all horses)	.620	.691	.557	.704	.691	.739	.670	.660	.780	.739	.665	.780
Cost of feed per applied horse day .....	.572	.513	.481	.430	.46	.484	.520	.488	.499	.537	.520	.564
Other stable expense per applied horse day.....	.428	.579	.375	.446	.436	.578	.413	.398	.550	.401	.499	.649
Total stable cost per ap- plied horse day.....	1.00	1.092	.855	.876	.896	1.062	.933	.886	1.049	.938	1.019	1.213

STREET CURBS IN TOLEDO

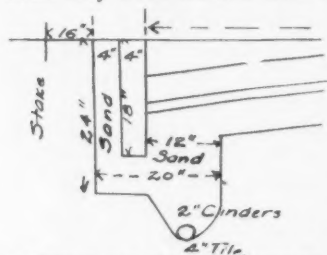
Sandstone Curbing Used Almost Exclusively—Method of Setting and Cost

By CHARLES L. SAWYER.*

Toledo, Ohio., has been using sandstone curb almost exclusively since she abandoned wood curbing. Medina stone was at first used altogether, but about twenty-five years ago it was learned that Cleveland was using on residence streets a softer sandstone from the Berea and Amherst quarries, which was giving good satisfaction. As this is about twenty-five cents a foot cheaper, costs less to dress, comes in longer pieces (some six feet and over, while Medina stone is seldom over three feet long) and wears as well on residence streets as the red sandstone, the city began using it. From 1889, when the Berea curb was first used, until five years ago, this blue sandstone was used exclusively, for cornerers as well as for straight curb. At present, however, Medina is specified for all main business streets and for all corners at street and alley intersections. Forty-seven per cent of the curb in Toledo is blue sandstone, fifty per cent is red (Medina) sandstone, and the remainder is concrete curb.

The old method of setting curb was to place 12 inches of sand under and 12 inches behind the curb; but at present all curb is set in 6 inches of sand, backing up with 4 inches, and 12 inches in front, placing drain tile beneath the curb. This construction, which has given very good results in the past twenty years, is shown in the accompanying sketch.

We find that wherever curb is well drained there has been very little trouble with its getting out of line.



METHOD OF SETTING CURBS.

In setting sandstone curb we are careful to have the specified amount of sand below the curb, and each piece tamped as it is set, so as to prevent the curb from settling. If there is not at least four inches of sand behind the curb and well drained, it is

likely to be pushed out of line by frost, as we have found to be the case on some of our streets.

On asphalt streets or on streets where there is much rolling to be done during construction, we find it good practice to set the curb at a slight angle from the perpendicular. This not only saves the edge and top of the curb but it insures more thorough rolling in the gutters.

Practically all the curb used in Toledo is 4 inches by 18 inches except on some business streets which are 6 inches by 24 inches. All curb is dressed on the street at a union rate of eight cents a foot. For corner stones the engineering department cuts out paper patterns, of different radii to fit the various corners, which are used by curb cutters on the street.

Berea and Amherst curb is being laid at a cost of about 45 cents; curved Medina at \$1.15, and straight Medina at about 73 cents. Curb is reset for 5 cents a foot, and redressed for 14 cents.

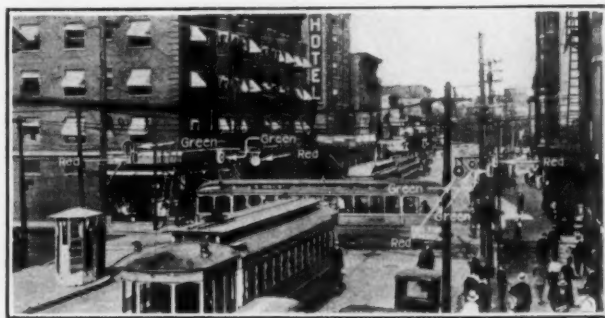
On one street which was repaved after having been down twenty-one years and had Berea curbing, 50 per cent of this curb was not touched, 3 per cent had to be replaced with new curb, 26 per cent was reset, and 21 per cent was recut and reset. Another street paved thirty-five years ago having red sand curb has just been repaved with practically no curb replaced with new, a very small per cent recut (about four-tenths of one per

cent), and only one per cent reset. Toledo has a dozen streets which have been repaved two or more times, in which the curb is nearly as good as the day it was originally set.

The cost of curbing on a repaving job is ordinarily about one per cent of the total cost of the improvement. A number of streets here have been widened when they were repaved and therefore all the curb had to be reset, which has been done at a cost of five or six cents per foot.

TRAFFIC SIGNALS IN CLEVELAND.

In our issue of January 7 we briefly described and illustrated the traffic signals being tried at Pittsburgh, Pa. A similar system was installed last August in Cleveland, O., at the intersection of Euclid avenue and E. 105th street, and has given satisfactory service ever since. The illustration shows how the red and green lights (which



SIGNALS AT CORNER OF EUCLID AVE. AND 105TH ST.

direct the traffic, as described in the previous article) are attached to corner poles, also the sentry box provided for the traffic officer. When a fire alarm is turned in, the officer in the booth is notified and throws an emergency switch, which sounds an alarm bell and flashes red lights at all crossings, and proceeds to the street to assist in clearing the crossing for the fire apparatus.

COMPULSORY MUNICIPAL RECORDS.

Editor, Municipal Journal,
Union Square, New York.

Dear Sir:—I fully agree with your editorial of December 10th, 1914, on "Street Cleaning Records" (advocating more general keeping of such records in some standard form). I would go a step farther and place it under state control; make it compulsory for every municipality within the borders of the state to report at least annually to an Information Bureau, this bureau to be in charge of practical men—men who could be sent out to instruct and coach others in organizing, systematizing and keeping records and advise in every way possible to bring this line of work to a standard.

The state would issue blank report cards in triplicate, one for the state, one for the city clerk or comptroller, and one for those in charge of the work, these to be filled in and placed on file.

This bureau would be a center where all kinds of information could be obtained pertaining to streets and pavements, such as material, machinery, tools, appliances, records for comparisons, etc. There are a thousand and one questions that such a bureau could answer to advantage, by which answers thousands of dollars could be saved annually.

Another good purpose such an information bureau would serve, would be to provide a place where those who experiment in different ways and discover new methods or labor-saving devices, could file their ideas for the benefit of those looking for them. As it is at present, a man gets an appointment or is elected for a short term; he may be an exceptionally good man, but of what benefit is his experience to himself or others after his term expires? where-as if his ideas could be preserved at some such center as a bureau, others would be benefited. In my opinion all branches of municipal work should be put on the same basis, not only the streets. Yours respectfully,

GEORGE FALK.

Commissioner of Public Highways, La Crosse, Wis.

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JANUARY 14, 1915.

CONTENTS

Street Cleaning by Motor Apparatus. (Illustrated.) By George L. Rinkliff	33
Liability for Fire.....	34
Street Cleaning in Chicago.....	35
Collecting Ashes and Garbage in Passaic. By Arthur Reid.....	35
Courses in Highway Engineering.....	36
Garbage Collection in a Small City. (Illustrated.) By L. J. Wertheim.....	36
Street Cleaning Data.....	37
Cincinnati Street Cleaning.....	38
Street Curbs in Toledo. (Illustrated.) By Charles L. Sawyer	40
Traffic Signals in Cleveland. (Illustrated).....	40
Compulsory Municipal Records.....	40
Motor Apparatus for the Street Department.....	41
Let Contracts Early.....	41
Service Tests of Pavements.....	42
Conduit Under Milwaukee River.....	42
Municipal News. (Illustrated).....	43
Legal Notes—Notes of Recent Decisions.....	48
News of the Societies.....	50
Personals.....	50
New Announcements. (Illustrated).....	51
Industrial News.....	52
Contract News.....	53

Motor Apparatus for the Street Department.

Ten years ago a few rash fire chiefs were trying out motor fire apparatus—chemicals mostly, as the heavier apparatus had not yet been introduced. Today ninety-nine per cent of the fire departments of the country have ceased buying horse-drawn apparatus. Will this history be repeated in the street cleaning departments?

Two of the principal advantages claimed for the motor fire apparatus were speed in reaching a fire and low maintenance cost when the apparatus was used but seldom. Neither of these would seem to apply to street cleaning and refuse collection apparatus, which is in use practically every working day, and which cannot generally move very rapidly by the very nature of the service it performs. Large trucks carrying material collected for long distances effect economy by high speed, and the use of them is recognized as advantageous. But will the use of motor sweepers and motor wagons for collecting sweepings, ashes and garbage come into general use?

Apparently the city manager of Springfield, O., not only has figured out an economy from their use but has proved it by several months' actual service, as described in this issue. No estimate is made in the calculation for interest, depreciation and repairs, but there

is apparently \$9.50 per day to cover these items on one pick-up sweeper and \$17.50 in the case of the motor truck—enough to buy new apparatus every twelve months.

Apparently speed does count in the economy, even with this apparatus; for one motor sweeper covers as much area as was previously done by two horse-drawn sweepers, and one motor truck has taken the place of five two-horse teams and wagons. The cost per day of the operator, gasoline and oil for a motor sweeper is 50 cents greater than one team and driver for horse sweepers, and there is the same difference between motor and horse-drawn truck. It is probable also that \$1.50 to \$3 per day should be added as additional allowance for the greater interest, depreciation and repairs in the case of the motor apparatus. But apparently in the case of Springfield this additional cost is much more than compensated by the greater service rendered.

Whether smaller or larger cities will find economy in using motor street apparatus as compared with horse-drawn and also as compared with hand sweeping; whether ash and garbage collection can be performed more economically by motor trucks and under what conditions—these and other questions await proof by experience. And it seems probable that the history of fire apparatus will be duplicated in that the next five years will see these questions pretty well settled and a rapid adaptation of motor apparatus to the requirements of such service.

Let Contracts Early.

Two or three months ago we called attention editorially to the advantages of taking forethought in the matter of this year's municipal improvements, completing the plans and letting contracts for the same as early as possible. In our issue of December 3d a city engineer showed by the experience in his own town how desirable such action has proved to be in their case. We have recently received further confirmation of this from a member of the city engineering force of Trenton, N. J., who states that extraordinarily low prices were received by the city last spring, which they attribute principally to the fact that the whole season's work was planned in advance; specifications, details and estimates were prepared during the latter part of the winter and early spring, and then the whole work advertised for in bulk. What appeared to be a proof of the fact that the low prices were due to early letting of contracts was furnished when it was necessary, about a month after the letting of the greater bulk of the work, to let an additional contract for exactly the same kind of construction. The bids received on this later contract were more than 17 per cent higher than those received a month previous.

"Surely," said he, "it would seem that advertising the years' work both in bulk and as early as possible is a very desirable consideration. It not only brings more competition and with this a certain amount of economy, but the preliminary engineering work can be given more serious thought and thorough study, thus eliminating to a considerable degree the possibilities of poor and ill considered designs which very often result from the preparation of hasty plans and specifications. One other important advantage which might be mentioned is that by starting construction early in the season, the possibility of having to carry over part of the work in an uncompleted state through the winter to the following spring is greatly reduced."

The Trenton work referred to was paving work, but the same considerations and advantages would seem to apply equally well to most other classes of municipal work. In the case of sewers, for instance, it would seem

to be practicable to begin construction work even earlier than in the case of paving, since an occasional interval of freezing weather for two or three days, such as may occur in the early spring and would be objectionable in the case of pavement foundations, need interfere little, if at all, with sewer construction. The reason for this, of course, is that the temperature at the bottom of a sewer trench is seldom below freezing, especially if there is water in the trench, and pipe laying or even concrete work can be carried on in the trench with little danger of freezing from such occasional cold snaps. Moreover, a large part of the work of sewer construction consists of excavation, and in fact the first week or two may be consumed in opening up trench, installing machinery, etc., before any sewer is laid at all. There therefore seems to be no reason why sewer work should not begin quite early in the season, the date of course depending upon the latitude.

Beginning work early in the spring would seem to offer advantages to all concerned. Those received by the city have been stated above. That the contractors find it advantageous is evident from the large number bidding and the fact that they are willing to secure less profit when they can thus extend their working and profit-making season. The firms furnishing material, such as sewer pipe, cement, paving brick, etc., must also find it an advantage to be able to begin earlier to clear their storage yards and thus make room for more material and reduce the rush in the shipping department later on, and to be able earlier in the season to get a line upon what the demand for their product will be and thus to regulate the output of their plant more intelligently. Also their payments for material sold will begin to come in earlier and thus assist the financial conduct of the plant. For all these reasons it is generally found that material can be purchased at a lower price for immediate delivery early in the spring than later.

All of these advantages, of course, are reflected in the lower prices obtainable by cities, thus offering an argument for early municipal action which none can belittle—that of less cost for equally good work. When we add to this the further argument that the design and execution of the work are likely to be even better, in spite of the lower cost, than when both designing and constructing are hurried by dilatoriness of council or others who must give authorization for the work, there would seem to be no argument left to excuse such delay.

Municipal Record Bureaus.

We are glad to receive the support of our idea of the importance of street cleaning records furnished by the letter on another page. We can see no reason why the suggestion that the State handle this matter and require such records could not be carried out. We fear, however, that it would not give the results anticipated by our correspondent. A few of the States have for several years been endeavoring to standardize the financial records of cities, but their success has been somewhat discouraging considering that the importance of such records has long been recognized by every taxpayer.

The great advantages of State control over the private collection of such statistics are that all the funds necessary could be made available, and city officials could be required by law to collect the necessary data and in a prescribed form. (Insuring their accuracy is, however, beyond even the law, we fear.) On the other hand, publications of the State generally receive little attention from 99.99 per cent of the citizens, except such parts as are reprinted or abstracted by daily papers and other periodicals; while the tabulations of such statistics by Municipal Journal, for instance, are read by thousands and saved for reference. Our tables, also, are published

while the records are fresh, but most state documents do not give information until it is one or more years old. (We have just received an extensive State report dated 1910, printed in 1914.)

As to the accuracy of enforced records of this kind, we have serious doubts. Those collected voluntarily are open to enough suspicion on this score; but an official who sees no sense in such things and turns in records only because he is required to will not devote the careful attention to the matter which is necessary for even approximate accuracy. You can lead a horse to water and even throw him into it, but you can't make him drink unless he is thirsty.

Our opinion is that the only solution is to stimulate the thirst and offer the wherewithal to quench it; to convince officials of the benefits of such record-keeping—its necessity, if efficiency is to be attained—and offer them satisfactory standard methods and forms to use therefor. This we are endeavoring to do, and we ask for the encouragement and help of those who, like Mr. Falk, realize the importance of the matter.

SERVICE TESTS OF PAVEMENTS.

In an article entitled "Service Tests of Street Pavements," H. W. Durham, then chief engineer of highways of the borough of Manhattan, New York City, discussed before the Am. Association for the Advancement of Science the testing of pavements by actual use, which he (rightly, of course) considered to be the only reliable and the final test.

Concerning carrying out such tests by so-called experimental roads, in which consecutive short sections of the road are paved with different materials, he stated that this idea seems very plausible on its face, but he does not consider that it furnishes final authoritative tests of the types of surfaces tested. "It is impossible to be certain that test conditions are the same for all the samples tested, and particularly in the construction of each one that conditions are fair to all and that each sample is the best of its type."

"Again, certain forms of construction which are eminently suitable for certain locations and under certain conditions of traffic are distinctly the reverse in other places; consequently, the failure of any one test section, while demonstrating nothing except that it has not lasted under the specific conditions to which it has been exposed, may bring it into unfair comparison with others."

"It is the belief of the writer that the only true test is furnished by determining which of each type of surface is satisfactory under real conditions of use; in other words, by observing streets and roads, not fractions, surfaced with those classes of material which among the many have given the best satisfaction; determining just which are the conditions under which each of these proves most advantageous; comparing types, traffic conditions, those of climate and other features as developed in different communities, and selecting from among all these the governing conditions which must be met and the classes of wearing surface most suitable to meet them."

CONDUIT UNDER MILWAUKEE RIVER.

The electric cables and steam service mains of the Milwaukee Electric Railway and Light Company are carried under the Milwaukee river in a line of 6-foot cast iron pipes having a total length between shafts of 208 feet and laid 29 feet below water level, or three feet below official channel bottom, and covered with 12 inches of concrete. As the river bottom is treacherous, the pipes are supported by piles. This submerged conduit has just been completed.

The WEEK'S NEWS

State Highways in Colorado, Kentucky, Iowa and Maryland—Metering in Albany, N. Y.; Birmingham, and Chester, Pa.
 —Waterworks Improvements in Virginia, Minn., and Omaha, Neb.—Hydro-electric Development of Oregon
 —Natural Gas in Kansas—New Jersey Cities' Gas Fight—Municipalities May Build Own Plants in Pennsylvania—New Motor Fire Apparatus in Many Cities.

ROADS AND PAVEMENTS

Colorado State Highways.

Denver, Colo.—The sum of \$1,259,087.09 has been expended by the state and counties upon state highways during the past two years, according to the preliminary biennial report of the State Highway Commission; 2,640 miles of roadway were graded during this period, at an average cost of \$430 per mile. The total mileage of state roads is given as 5,544.5, and total mileage of roads of all classes is placed at 31,000.

New Highway Ruined by Landslides.

Tacoma, Wash.—The new Olympic Highway, state road No. 14, which was recently completed along the shores of Hood's Canal to connect with the highways of Clallam and Jefferson counties, has been practically wiped out by a series of heavy slides. In some places entire sides of the mountains slid in. It is estimated that a sum equal to the original cost will be needed to repair the highway, and the legislature will be asked to appropriate the sum.

New Concrete Bridges.

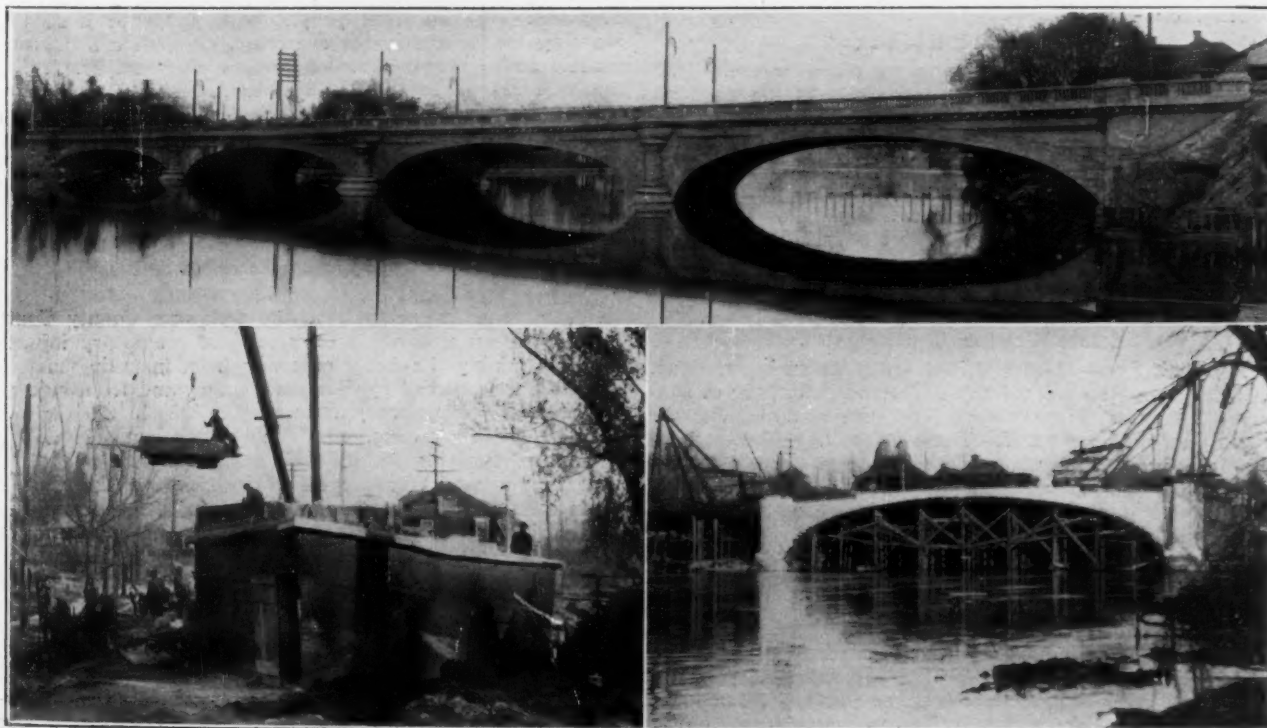
South Bend, Ind.—Over 50 men are now at work on a new \$100,000 bridge over the St. Joseph River, at North Michigan street here. The new bridge consists of three arches made of reinforced concrete faced with Bedford stone. The work is almost completed and it is expected that the bridge will soon be open for traffic. The middle arch is 116 feet and the two end ones are 80 feet each. The roadway will be 40 feet wide with 13½ feet sidewalks on each side. 12 cluster lights will illuminate the bridge. This is one of the three new bridges in St. Joseph's county—the other two being just completed. Of these the Jef-

terson boulevard bridge is shown in the upper illustration and the Logan street bridge was recently described and illustrated in these pages. Charles W. Cole, city engineer of Michigan designed the Michigan street bridge and the work was done by the Cleary-Kuert Construction Co., of Indianapolis, while Frank Newcomer, of Indianapolis, was engineer in charge. The two lower photographs show work in progress on the latest bridge.

Iowa State Highway Work.

Des Moines, Ia.—A year and a half of work by the present highway commission and its results have just been reported. The commission desires legislation that will make possible the formation of road districts, and these districts be given the authority to contract for permanent roads. The commission urges that the cost be divided into three parts—that for the state, for the county and for the land in the district. This year there has been work done on the county road system to the extent of about \$4,000,000. On the township roads there has been expended \$3,000,000. On bridges and culverts the expenditure has been between \$3,500,000 and \$4,000,000.

The locating and adoption of the county road system was the first big task. This involved a vast amount of investigation and inquiry to cover the 15,000 miles of the system. There is yet under protest about 2,560 miles which will necessitate the inspection of twice that mileage before the work is done. Complete surveys, profiles and maps have been prepared. Bridge designs have been prepared for 61 counties for bridges costing \$683,980.66. At a cost of operation of \$7,858.20 designs were prepared for work estimated in value at \$1,033,980.66. The commission urges that the county road systems be extended within city lines



Courtesy, South Bend (Ind.) Tribune.

NEW BRIDGES IN ST. JOSEPH'S COUNTY, IND.

and that a road levy in the cities be made for these roads; that county and township officers be given more power over removal of brush and weeds from roads; to raise the limit from \$300 to \$1,000 where resolutions of necessity are required for bridges; that drainage districts may be created for roads; that all poll tax be payable in cash; that some way be found for doing permanent road work on the township roads; and that provision be made for altering the county road system under certain circumstances.

Paving Law Unconstitutional.

Frankfort, Ky.—The act of the legislature of 1912 providing that cities of the third class may by ordinance construct pavements and streets to be paid for by the abutting property owners on the ten-year payment plan was held to be unconstitutional by the Court of Appeals in the case of J. H. Hickman, mayor of Owensboro, against Hugh Kimbly. The court holds that it violates the constitution, which provides that no act shall be revised, amended, extended or conferred unless it shall be re-enacted and published at length. This precaution was not taken in the passage of this act, and, therefore, it is held to be unconstitutional.

State Roads Commission May Select Route.

Annapolis, Md.—Ruling that the act of the legislature providing for building the system of state roads left it to the discretion of the State Roads Commission in determining what roads are to be built as well as the question of main and secondary gaps, Judge Brashears, in the Anne Arundel Circuit Court, dismissed the bill for an injunction against the commission by Caleb C. Magruder, clerk of the Court of Appeals, and other taxpayers of Prince George's and Anne Arundel counties. The action was brought to compel the commission to follow the route of the old State road, through Anne Arundel county in building the state highway from Annapolis to Washington, the contention being that this was provided in the original road law of 1908, and the further fact that it will be of benefit to a greater number of farmers than to divert the course. The contention that brought about the injunction suit was over the roads commission's plans to expend some of the Prince George's county road funds in the improvement of the gaps from Camp Springs to Meadows, and Marlboro and Hill's Bridge, in that county. The appropriation of \$63,000 available was apportioned between these two sections.

To Make Toll Road Free.

Montpelier, Vt.—Steps have been taken whereby the Peru turnpike, one of the last toll roads in the country, will become a free state highway. The road lies in the towns of Windham, Londonderry and Peru in the southern part of the state. At the last legislative session it was voted to free the road, either through purchase by the state from the Peru Turnpike Company or sequestration proceedings with the alternative proposition of building a parallel state road. Commissioners appointed by Governor Fletcher after several hearings have decided upon condemnation proceedings.

Street Work in Portland, Ore.

Portland, Ore.—Municipal improvements during the past year, while not so marked as in 1912 and 1913, were of substantial nature. Figures have just been compiled for the fiscal year ending Nov. 30. There were 23.83 miles of hard surface pavements laid and other streets were improved by grading and macadamizing to the extent of 27.46 miles, making the total amount of streets improved 51.29 miles. The total cost of the street improvements completed during the year was \$1,373,536. There were 28.17 miles of sewers laid at a cost of \$418,014, making the total of street and sewer improvements for the year \$1,791,550. In 1913 there were constructed a total of 99.66 miles of streets and 62.96 miles of sewers, at a cost respectively of \$2,732,653 and \$541,943, or a total of \$3,274,596. There are now in this city 347.21 miles of hard surface pavements and 385.01 miles of graded, macadam and gravel streets, making a total of 732.22 miles. Based on the 1910 census of 207,214 inhabitants, there are 1.56 miles of pavements to each 1,000 inhabitants. In addition there are 467.78 miles of unimproved streets, making a total of 1,200 miles of streets in Portland.

WATER SUPPLY

Wants Meters for Reducing Waste.

Albany, N. Y.—Commissioner of Public Works Greenalch declares that all of Albany's water system should be metered. The per capita consumption of water in a day, 242 gallons, shows a great waste of water, said the commissioner. At present in the city of Albany there are 6,560 meters in place, over 800 of this number being put in place in the past year. Every new service is equipped with the water meters. In July, 1912, the common council passed an ordinance requiring that all new services be metered. The city has been spending about \$10,000 a year to meter the services and a bond issue of \$200,000 is asked.

To Engage Water Supply Experts.

San Diego, Cal.—Before the city enters into a contract to purchase the Volcan water system a committee of property owners have petitioned the council that M. M. O'Shaughnessey, city engineer of San Francisco, and J. B. Lippincott, hydraulic engineer of Los Angeles, be employed to make a thorough investigation of the system and report to the council. The council favored the suggestion. The purpose of the investigation of the Volcan water system will be as to its reasonable value, the probable cost of the construction of so much of the impounding works, reservoirs and conduits as may be necessary to furnish the city at least with ten million gallons of water daily, the amount of water which can be developed and supplied to the city through said system, the time probably required to deliver to the city 10,000,000 gallons daily through the system and the time probably required for the construction of such properties of the system as may be necessary to deliver such quantity of water.

Flat Rates in City, Meter in Suburbs.

Birmingham, Ala.—The Supreme Court has upheld the contentions of the Birmingham Water Company in which it claimed that flat rates were legal in old Birmingham and meter rates in the municipalities annexed into Greater Birmingham. The decision means that the charters with the respective sections of the city hold only for those sections and must be respected.

Water Supply Shut Off.

Norwalk, O.—For the first time since the city water works system was installed, the water supply has been shut off. Alleging that people have failed to heed the warning to use the water sparingly, city officials ordered drastic action, the reservoirs being almost empty. What water is now available will be conserved for fire protection. As now arranged, water is pumped into the mains from 9:30 to 10:30 a. m., and from 2 to 3 p. m., and all users are expected to take enough in those hours to supply needs for the day. City officials claim that the shortage could have been avoided were all services metered. Lack of heavy rains in the fall left the reservoirs but partly filled.

City Opposes Metering.

Chester, Pa.—The New Chester Water Company has been defeated in an important suit, the Delaware County Court handing down a decision in which the temporary injunction restraining the water company from installing meters in 100 houses owned by Charles Palmer, and from cutting off the water on January 1 from all houses in Chester not connected with meters, was made permanent. It was a test case, applying to all similar situations in the state, and the city of Chester, which is opposing the change from a flat rate to a meter system, considers the granting of this injunction a sweeping victory for the opponents of increased rates. William B. Harvey, the water company's attorney, argued that the court had no jurisdiction, as all questions relative to public service corporations had been placed in the hands of the Public Utilities Commission, and he asserts that all court rulings so far made had been in support of their contention. Judges Johnson and Broomall declared that while the court could not consider the reasonableness or unreasonableness of the rate question, it was within the power of somebody to slow up the water company until the Public Utilities Commission disposed of the case, which has been taken to it, and in their opinion the county courts have this power. The water company in the

past has charged a flat rate of \$6 a year for each spigot, and the minimum rate is \$12 a year. The increased rate means a doubling, or a difference of several hundred dollars a year to the plaintiff, especially as under the new system the landlord is held jointly responsible with the tenant for the payment of the water rent. Palmer opposed the placing of meters in his houses, and asserted in his petition for a preliminary injunction that entrance to the houses was gained by the contractor who has been installing meters by force, trickery and threats to shut off the water.

Twenty-nine hundred meters have been placed by the water company within the last two months, and as a result of this injunction the company expects a number of suits and absolute refusal of property owners to allow meters in their houses. The ruling establishes a precedent, and the injunction is binding until the Public Utilities Commission takes action and hands down a decision.

\$1,000,000 Reservoir Complete.

Virginia, Minn.—The new \$1,000,000 concrete reservoir auxiliary to the Virginia water supply is practically complete. Construction work has been in progress for several months. Risberg & Marvick were the general contractors and a large force of men have been employed. The city now has a water plant ample to fill its needs for many years to come. The new structure will be used as a reservoir and settling basin.

Kansas Citizens May Have Free Water.

Topeka, Kan.—An enabling act that will permit the cities of Kansas owning their own water plants to furnish water free to the citizens has been proposed for the next legislature by Governor Hodges, and several members of the legislature.

"Water is a necessity," said the governor. "The cities are now giving the people free sewer service, after the cost of the sewer is paid, so why shouldn't the city furnish water on the same basis. Each citizen should be allowed a certain amount of water free, for each day. If more than that is used, a charge could be made for the excess. A limit of 50 gallons of water to each person would give practically everyone all the water they needed during the year. The water plant would be paid for by the entire city, but the mains would be paid for by benefit districts as sewers are now built, and each property owner would pay for his service lines, as he does now for sewer connections." Kansas has 198 cities with water systems, and only 16 of these are owned by private corporations. All the others are municipal plants. Rosedale buys its water from Kansas City, Mo., and Gas City buys its water from Iola, but all the other cities have plants of their own. Nearly as many cities have sewer systems as have water works, and all but one of these systems is owned by the cities.

Company Wins Water Suit.

New Brighton, Pa.—Efforts of the Borough of New Brighton to procure the plant of the New Brighton Water Company by and under the Act of Assembly of April 29, 1874, have been unsuccessful. The supreme court has reversed the judgment of the local court, quashed the writ, entered judgment for the defendants and placed the costs of the proceeding upon the borough. This was in proceedings on the part of the Borough of New Brighton, seeking to take over the plant of the company under the act of incorporation which says that "It shall be lawful at any time after 20 years from the introduction of water or gas, as the case may be, into any place as aforesaid for the town, borough, city or district in which said company shall be located, to become owner of said works and the property of said company by paying therefore the net cost of erecting and maintaining the same, with interest thereon at the rate of 10 per cent. per annum, deducting from said interest all dividends therefore declared."

On January 4, 1913, the town council of New Brighton decided to take over the plant, provided the people of the borough approved an issue of bonds to pay for the same, should such issue become necessary and provided the cost

of such plant comes within the limit of the borrowing power of borough. Notice was served upon the company to furnish a statement of the net cost of construction and maintaining the plant and of the dividends therefore declared by the company and to open books, papers and vouchers so that the Borough could check and verify the statement. The company failed to comply with the notice and in the return filed to the alternative writ of mandamus issued against them, raised the question of the borough's ability to purchase the plant. The borough then amended its petition by bringing a statement of its borrowing capacity before the court. The defendants claimed that the net cost of erecting and maintaining the New Brighton Water Company's plant exceeds the sum of \$500,000.

Waterworks Improvements in Omaha, Neb.

Omaha, Neb.—Nearly \$500,000 was spent during 1914 improving the water plant, 23 miles of mains and 211 new fire hydrants have been installed. In spite of the money spent for improvements water rates were reduced twice during the year, the January lowering of rates making the cost of water one-third less than when the plant was taken over by the city. Last July another reduction of 5 per cent. on all bills paid within ten days was ordered. Improvements at the Florence pumping station have resulted in a great saving in coal and an immense new reservoir completed at Walnut Hill station almost doubling the capacity. More than 1,350 new services have been placed during the year bringing the total number of services to about 26,500.

LIGHTING AND POWER

Plan Hydro-Electric Development of Oregon.

Eugene, Ore.—Following the three-day session of the State Commonwealth Conference, the Hydro-electric Commission is drawing up plans for the organizing of hydro-electric development and distribution in the state. In the proposed plan districts are to be formed according to the California plan and these will be given power, with the consent of the people, to bond themselves for the construction of power plants and distribution systems. The district could either buy its current wholesale from existing companies or generate its own power. Another problem to be worked on is whether municipal and district plants should be regulated by the railroad commission. The third expected recommendation is on the subject of municipalization of privately-owned utilities at appraised value.

New York to Try Nitrogen Lamps.

New York, N. Y.—Mayor Mitchel has approved the resolution passed by the Board of Aldermen, permitting Commissioner Williams of the Department of Water Supply, Gas and Electricity to purchase nitrogen filled lamps at a cost not exceeding \$11,000. The new light is to replace the old electric arc light, not only on the streets of the city, but on the Williamsburg and Brooklyn bridges.

Control of Kansas Natural Gas Utilities.

Topeka, Kan.—The stock and bond issue of the Kansas Natural Gas Company is to be reduced twelve million dollars, pipe line trunks and connecting lines are to be turned over to the company as soon as the creditors are paid, a million and a half is to be spent for betterments and improvements, state creditors are to stay in control for six years, and by terms of a stipulation filed in the Supreme Court by John S. Dawson, attorney-general, all gas company litigation is ended. The stipulation was signed by the attorneys and officials of the Kansas Natural, the Kansas City Pipe Line Company and the Marnett Company, which ends all pending litigation, including the anti-trust suits pending in the Supreme Court. The agreement provides that first mortgage bondholders consent to an 8 per cent loss and second mortgage bondholders to a 25 per cent loss in the reducing of twelve million dollars from the gas company's stock and bond issue. This action reduces the capital of the company to about \$10,000,000—virtually the valuation found in the investigation of the Kansas

Public Utilities Commission. Application will be made to the Public Utilities Commission for an increase in rates, and it is the belief of the attorney-general that if a fair rate is allowed the gas company will be able to show an annual earning.

The Kansas Public Utilities Commission has been holding hearings on the nature of the service of the gas companies, and tentative rules and regulations relating to the governing of standards of quality, pressure and accuracy of measurements by natural gas utilities of the state have been proposed. The minimum heating value of gas offered for sale is governed by a ruling reading that no utility shall offer gas having a heating value lower than 800 British thermal units per cubic foot, except by permission from the commission. All operating pipe lines and producing companies shall furnish chemical analyses from any or all wells from which their supply is obtained. The pressure of gas furnished consumers will be governed and the daily variation of the consumer's meter shall not exceed 100 per cent of the minimum pressure at the meter.

City Wins Light Controversy.

Providence, R. I.—The city was successful in its contest with the Narragansett Electric Lighting Company over the rates to be paid the company for the lighting of public buildings. Officials of the company have informed the city council finance committee, which carried on the negotiations, that it will accept the city's interpretation of the franchise agreement and bill its current for public buildings at four cents per kilowatt hour, instead of at 10 cents, minus a discount, for which the company has contended up to this time. Decision by the corporation to make this rate does away with the possibility of the dispute being dragged into the courts and also means that the city will save in the vicinity of \$150,000 over what it would have paid had the 10-cent rate been made for the term of the franchise.

Public Utilities of Coshocton.

Coshocton, O.—The public utility valuation for Coshocton this year is \$7,591,570, an increase of \$351,340 over 1913, according to figures given out by the State Tax Commission. Public utility valuations for the entire state show an increase of \$37,751,410 over last year.

No Power Dams to be Built.

Charleston, W. Va.—Because the commission was divided as to its authority, and had no funds from the legislature to employ hydro-electric engineers to advise it in the construction of dams, the public service commission refused to grant applications for dam sites for hydro-electric purposes in rivers of West Virginia, except in the case of the Northern Virginia Power Company, which will be allowed to increase the height of its dam, in the Shenandoah River, nine feet, by the construction of a new dam at a location yet to be determined. The rejections were in the applications of the Virginian Power Company and the Tri-State Milling and Power Company for dams in New River; the Gauley Power Company for dams in Gauley River; the State Line Power Company for a dam in Cheat River; and the Fairmount and Clarksburg Power Company. The applicants were given the privilege of insisting on an order to permit the cases to be continued until next March, the commission expressing a preference to enter an order rejecting applications unless such order was demanded.

New Jersey Cities' Gas Fight.

Newark, N. J.—Mayors from several of the larger cities of the state met here and received a report by the lawyers conducting the fight to have the Court of Errors and Appeals reverse the decision it gave in the ninety-cent gas case. It was decided to hold another meeting when steps will then be taken toward the framing of some measure along the lines of the Ford Franchise Bill of New York, which provides that a state body should be appointed which body shall assess the value of the franchises of the utility corporations and the assessment then be apportioned among the different municipalities and entered on their tax books. This method would result in a heavy increase of revenue coming into the treasury of the cities.

Upon suggestion of Mayor Frederick Donnelly, of Trenton, it was decided to have the cities of the first and second classes bear the expense in bringing the final steps in the present argument before the Court of Errors and Appeals. The meeting was opened by Mayor George Seger, of Passaic, who stated that the gas fight was started four years ago by Passaic and Paterson, the two municipalities which have borne an expense of over \$5,000 each with the result that the gas rate was reduced to ninety cents from \$1.10. The object of the meeting was to make the new fight a state-wide one and not one centered in the Passaic district alone.

George L. Record, who acted as special counsel for Passaic and Paterson, explained the entire gas fight from the very beginning. He stated that even though the present decision was decided one way or the other, it would have to go into the United States Supreme Court and mean a six-year legal battle. As to the opinion of the Court of Errors and Appeals, he believed it was decidedly wrong in its stand on the question of the taxation of the franchise property. He also stated it was wrong when it held that no city could certiorari the Utility's Board's decision. Those present were: Mayor Donnelly, Mayor George N. Seger, Passaic; Mayor Thomas L. Raymond, Newark; Mayor Mark Fagan, Jersey City; Commissioner Brensinger, Jersey City; City Counsel Albert O. Miller, Passaic; Mayor Robert H. Fordyce, Paterson; George L. Record, Jersey City, and City Counsel Frazer, Newark.

Municipal Plant Reduces Rates.

Virginia, Minn.—The water and light commission has authorized a further reduction in the rates of light and power services from the municipal light, heat, power and water plant. Under the new schedule the rate on lighting service is reduced from 7 to 6 cents a kilowatt with a minimum of 75 cents and on power to 4½ cents with a minimum of \$1.50 a month. The reductions announced amount in a year to approximately \$15,000 to the consumers of light and power. The reduction on light rates is the third that has been made since the city has operated its own light, heat, water and power plant.

Municipality May Build Plant.

Harrisburg, Pa.—The Public Service Commission has established a precedent upholding the right of a municipality to construct its own electric light plant for furnishing electricity to light its streets and other public places and not for sale, without first having obtained the consent of the Public Service Commission. The borough of Gettysburg filed a petition for the commission's approval of an electric light plant for its own use. A protest was entered by the Gettysburg Light Company, and a hearing was held to determine the preliminary question of the necessity of the borough first to obtain the approval of the commission before beginning operation. The protest was overruled.

Council's "Permission" is Not Franchise.

New York, N. Y.—The Supreme Court of the United States at Washington, in an opinion written by Justice Hughes, has decided in effect that the New York Electric Lines Company had no vested right under its so-called franchise granted in 1883 by the Common Council of New York City for laying electric connections in the streets of New York, and also decided that the franchise in question was in substance a revocable license and had actually been revoked. Justice Hughes reasoned that permission such as that given by the Common Council could not be construed as a perpetual franchise. The case was that of the New York Electric Lines Company vs. the Empire City Subway Company. The New York Electric Lines Company was organized in 1882, and in the following year received permission from the Common Council to lay electric wires and other connections in city streets. As set forth in a brief this grant was set aside by a city department on May 11, 1906. On June 10, 1910, the New York Electric Lines Company offered the Empire City Subway Company \$5,000 rental for space in its tubes, and the offer was rejected. The Lines Company then brought suit to compel the renting of space. The suit was lost in New York State and finally in the Supreme Court of the United States.

New Municipal Plant Opened.

Bellefontaine, O.—The new \$35,000 municipal electric light plant has been opened here. It is operating satisfactorily.

Votes in Favor of Franchise.

Mt. Morris, Mich.—The village decided by a vote of 130 to 2 to give the Flint Electric Company the franchise for lighting for next year.

Cost of Street Lighting.

Omaha, Neb.—The cost of lighting the streets with gas during 1914 was \$23.82 a lamp, according to the annual report of J. P. Butler, gas commissioner. During the year 1,247 lamps were kept burning. The cost of gas per lamp per year was about \$14; mantles, chimneys and globes cost about \$2.50 a lamp, and salaries about \$7 a lamp.

Street Lighting Contract.

North Adams, Mass.—The city of North Adams has just completed the terms of a new contract with the North Adams Gas & Light Company for the street lighting of the city. Arc lights are to be furnished by the gas company at the rate of \$78 per annum instead of \$80 as at present. Incandescent lamps are to be furnished at the rate of \$18 instead of \$25 a year. It is planned to have incandescent lights on both sides of the street rather than having one arc light on the corner.

FIRE AND POLICE

Water Shortage Blamed for Big Blaze.

Pottsville, Pa.—Because the Pottsville Water Company is considered responsible by city officials for Pottsville's \$1,200,000 blaze, lawyers have been retained by business men who were burned out to prosecute the water company. The latter is said to be the wealthiest corporation in the anthracite region. It is alleged by merchants that the desire of the water company to keep up its big earnings by saving water resulted in the great calamity to Pottsville, and caused some of its most prominent business structures to be laid in ashes. J. W. Moyer, one of the lawyers engaged, states that the proceedings will either be for the recovery of damages or the revocation of the company's charter. It is claimed that the company was chartered to furnish water only to private consumers in certain territory, and that it has greatly exceeded its legal privileges by furnishing water to railroad companies and coal corporations. Mayor Pierce Mortimer stated that the fire could be ascribed to the lack of water. The statement of the mayor is backed up by Fire Chief James Lynaugh; but W. D. Pollard, superintendent of the water company, says the normal pressure of water was on.

Want Life Jobs for Fire Chief.

Boston, Mass.—The fire chiefs of Massachusetts have decided to make an attempt to remove their offices from the sphere of political influences and in response to a request from a number of the chiefs, Fire Prevention Commissioner John A. O'Keefe has drafted the following bill which will be submitted to the incoming legislature:

"The chief engineer of the fire department of any city or town heretofore or hereafter appointed or elected, shall hold his office continuously during good behavior unless incapacitated through physical or mental disability from performing the duties of his position; provided, that the mayor of the city with the consent of the confirming power, the fire commission or fire commissioners when such commissioner or commissioners are the appointing power, with the consent of the mayor, and the confirming power, and in towns, the selectmen, may remove the chief engineer of the fire department for just cause and for reasons specifically given by the office or board ordering the removal.

"The person sought to be removed shall have notice and shall be furnished with a copy of the reason required to be given in section one and shall be allowed a reasonable time to answer the same in writing. A copy of such reasons, notice and answer and of the order of removal shall be made a matter of public record of the fire department."

The fire fighters are of the opinion that, assured of a permanent tenure of office during good behavior, the chiefs will be in a much better position to perform their duties in an impartial way.

New Fire Alarm System Completed.

Santa Cruz, Cal.—The mayor and commissioners have tested the new Gamewell fire alarm system that has been installed throughout the city. There are 35 boxes and 25 miles of wire, and it cost about \$8,000. The system is equipped with a speed transformer, a new development.

MOTOR VEHICLES

New Ladder Truck in Commission.

Tiffin, O.—The new ladder truck, Tiffin's first piece of motor fire apparatus, has been placed in the central fire department house. It was made by the American-La France Co., Elmira, N. Y. Each member of the department will be expected to be able to drive the apparatus.

New Truck in Use.

Burlington, N. J.—The Young America Fire Company have improved their fire fighting capacity by adding an auto truck. In a test run, in five minutes the company had gone a mile, put 450 feet of hose on a fire hydrant and had a stream at work. The truck will replace the hand-pulled hose carriage and will be a great addition to the apparatus. It will carry 25 men and is equipped with two chemical tanks.

New Pumper Tested.

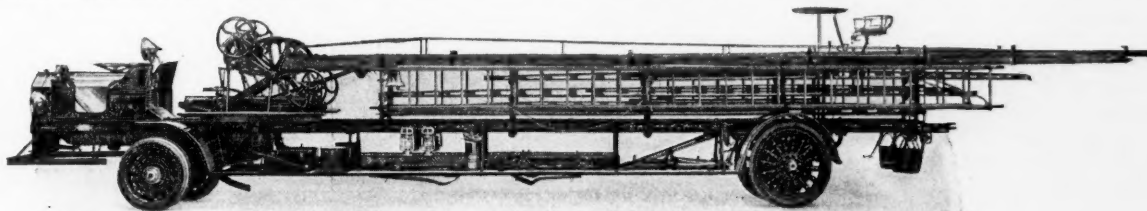
Fort Worth, Tex.—The new American-La France \$8,250 combination auto-pumping fire fighting engine has been tested by Fire Chief Bideker. The draft was 840 gallons a minute under a pressure of 120 pounds, although the guarantee was for only 800 gallons. Chief Bideker says the draft will be increased about 25 per cent. The engine carries 1,000 feet of hose and is supplied with ladders, hooks, axes, chemicals and other apparatus. It has a six-cylinder engine with 105-horsepower rating. The packing interests paid half of the purchase price and the city paid half. This arrangement was made because the packing-houses are in Niles City and do not pay Fort Worth taxes. All other expenses will be maintained by the city.

New Truck Arrives.

Hampton, Va.—The new \$5,000 automobile truck and combination tractor for the Hampton fire department has arrived. The new machine is the latest tractor put out by the American-La France Company.

Duluth's New Aerial.

Duluth, Minn.—In a news item in our issue of December 24 it was erroneously stated, through misinformation, that the aerial recently bought by Duluth was made by the Seagrave Company. As a matter of fact the apparatus is the product of the American-La France Company, Elmira, N. Y. The new truck has been tested and put into service. Commissioner Hicken and Fire Chief Randall are thoroughly pleased with the new apparatus which brings the total of motor units in the department up to fifteen. The accompanying illustration shows the new aerial.



DULUTH'S NEW AERIAL.

New Combination Tested.

Goshen, N. Y.—The new American-La France combination pump and hose car recently ordered by the board of trustees has arrived and been tested. The new machine was found satisfactory. The car is equipped with a 70 horsepower motor, and has a wheel base of 140¾ inches. It is fitted with steps at the side and rear, and carries 1,200 feet of hose, one 20-foot extension ladder, one 12-foot roof ladder, two hand extinguishers, axes, crowbars and other equipment. It is fitted with a rotary gear pump having a capacity of 500 gallons per minute. In addition to the regular gasoline tank holding 15 gallons, there is an auxiliary tank with a capacity of 28 gallons. There are two ten-inch reflector lamps at the sides of the machine, and a ten-inch searchlight of high power. In addition to the siren whistle there is a locomotive bell. The accompanying illustration shows the engine during the test.

MISCELLANEOUS

Want Municipal Telephones.

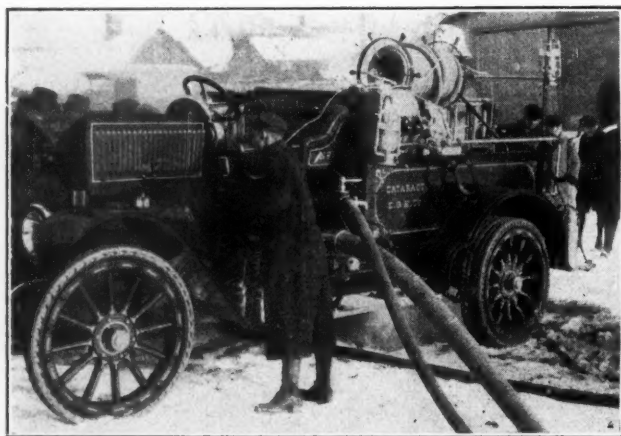
Garden City, Kan.—A petition signed by nine-tenths of the voters of Garden City, asking for a municipal telephone system, has been presented to the city commissioners here. The cost of various telephone systems is now being investigated and the new telephone system is practically assured.

Baltimore Has Municipal Dances.

Baltimore, Md.—Opened by the mayor and directed and supervised by the Playground Association, Baltimore's municipal dances have begun. According to a ruling of the board of estimates, an admission fee will be asked of all who attend the dances, which will be 15 cents for the men and 10 cents for women. The admission fee is intended simply to cover expenses.

Specifying of Local Firms Illegal.

Philadelphia, Pa.—Provisos attached by councils to appropriations for the year 1915 to the Department of Receiver of Taxes and other divisions of the city government specifying that when bids for supplies shall be invited only Philadelphia firms whose plants are located here be considered and the list approved by the City Controller, according to City Solicitor Ryan, are illegal and consequently not binding. Mr. Ryan gave his opinion on the subject in answer to an inquiry from Mayor Blankenburg: "The act of May 23, 1874, positively requires that all contracts for work, material, etc., to be supplied to the city or its departments, must be awarded to the lowest responsible bidder. This statutory requirement is not subject to qualification or exception in cases where compliance with it is possible, and the courts have frequently decided that any restrictions placed by the municipal authorities upon the free and complete operation of this act are null and void."



Courtesy, Breese, Middletown (N. Y.) Times-Press.
TESTING GOSHEN'S NEW COMBINATION.

LEGAL NEWS

A Summary and Notes of Recent Decisions— Rulings of Interest to Municipalities

Public Improvements—Lien for Improvements.

Town of Russell v. White.—A lien for a street improvement upon abutting property cannot be questioned on the ground that the improvement did not comply with the contract, where it was accepted by the proper municipal authorities, unless it be shown that they were guilty of fraud or mistake.—Court of Appeals of Kentucky, 170 S. W. R., 609.

Public Improvements—Assessment of Benefits.

City of Spokane v. Kraft et al.—Assessments for public improvements must be distributed with substantial equality over all property of like kind and similarly situated with reference to the improvement, and a property owner may not be required to pay more than his relative share of the cost of the improvement.—Supreme Court of Washington, 144 P. R., 286.

Alleys—Change of Grade—Damages—City's Liability.

City of Louisville v. Koshewa.—The grade of an alley once established, though the alley be not graded or constructed in accordance with the grade, cannot thereafter be changed without subjecting the city to liability for damages to any property owner who has purchased or improved the property or otherwise acted on the faith of the established grade.—Court of Appeals of Kentucky, 170 S. W. R., 964.

Costs—Allowance Against Municipality—Statute.

Bradley v. Village of Union.—Code Civ. Proc. Sec. 3245, declaring that costs cannot be awarded to the plaintiff in an action against a municipality, unless the claim was presented to the municipal authorities for audit before commencement of the action, has no application to an action brought in justice court; and a municipality, by appealing from a judgment rendered against it in justice court, cannot deprive plaintiff of his right to costs in case of his ultimate success.—Supreme Court, Appellate Division, Third Department, 150 N. Y. S. 112.

Defective Sidewalks—Notice—Burden of Proof.

Hamilton v. City of Cambridge.—Under Rev. Laws, c. 51, sec. 18, providing that if a person sustains bodily injury by reason of defects on a highway, and such injury might have been prevented or defect remedied by reasonable care on the part of the city obliged to repair it, he may, if such city had or by the exercise of proper care would have had reasonable notice of the defects, recover damages, the burden is on the plaintiff to show that the city had knowledge or by the exercise of reasonable care and diligence might have had knowledge, of the defect in time to have remedied it or prevented the injury.—Supreme Judicial Court of Massachusetts, Suffolk, 106 N. E. R. 1018.

Road Superintendent—Election—Majority.

Smiley v. Commonwealth.—Acts 1908, c. 280, as amended by Acts 1910, c. 8, provides that there shall be appointed biennially, by the supervisors of the county, a superintendent of roads if the board deems such superintendent necessary. Code 1904, section 832, provides that all questions submitted to the board of supervisors shall be determined by a vote of a majority, and in case of a tie it shall be determined by a commissioner in chancery appointed as tie breaker by the circuit court of the county. Held, that a "majority" of the board necessary to elect a road superintendent meant a majority of all the members-elect of the board; and hence, where a board of supervisors consisted of six members and there was a tie on the election of a road supervisor, the tie could not be broken by the vote of the tie breaker appointed by the circuit court.—Supreme Court of Appeals of Virginia, 83 S. E. R. 406.

Obstruction of Alley—Injunction by Abutting Owner.

Anderson v. Landers-Morrison-Christenson Co.—An owner of property abutting upon a public alley may maintain an action to restrain and enjoin an unlawful attempt permanently to obstruct the alley and prevent the free use thereof by such abutting owner.—Supreme Court of Minnesota, 149 N. W. R. 669.

Defective Streets—Injuries to Pedestrians—Contributory Negligence.

Burke v. City of Lynn.—Evidence held to sustain a finding that a pedestrian, injured on a defective sidewalk on a dark and rainy night, exercised due care, in view of the fact that he could rely somewhat on the expectation that the sidewalk would be free from dangerous defects, though he must have been near the curbstone, or his foot might have been over it, at the time of the accident.—Supreme Judicial Court of Massachusetts, 106 N. E. R. 995.

Public Improvements—Procedure—Necessity of Ordinance.

City of Monett ex rel. Schneider v. Fowler.—Under Rev. St. 1909, section 9254, authorizing cities of the third class to enact ordinances for the purpose, among others, of opening and grading streets, etc., and constructing and repairing sidewalks, the improvement must be authorized by some proceeding of the city council having the force and effect of an ordinance, and where there was neither an ordinance passed, nor proceedings had with the formality required in passing an ordinance, a tax bill for the improvement was void.—Springfield Court of Appeals, Missouri, 170 S. W. R., 684.

Streets—Nonuse—Abandonment.

In re Ludlow Ave. and Whitlock Ave. in City of New York.—Highway Law (Laws 1890, c. 568) § 99, and its predecessor (Rev. St. [1st Ed.] pt. 1, c. 16, tit. 1, art. 4, § 99, as amended by Laws 1861, c. 311), providing that every highway, which shall not have been opened and worked within six years after dedication or laying out, shall cease to be a highway, and every highway that shall not have been traveled or used as a highway for six years shall cease to be such, and every public right of way which shall not have been used for such period shall be deemed abandoned as a right of way, are equally applicable to streets in cities and villages as to roads in the country.—Supreme Court, Appellate Division, First Department, 150 N. Y. S., 256.

Care of Streets—Cutting Shade Trees—Liability.

Munday v. Town of Newton et al.—The act of a town, authorized thereto by Revisal 1905, § 2930, providing that a town board of commissioners shall keep the "streets," including the sidewalks, in proper repair to the extent that may be deemed best, and by its charter (Priv. Laws 1907, c. 39, § 62), authorizing the board of aldermen to improve the streets and sidewalks and to trim trees therein, done in good faith, in cutting down shade trees on the sidewalk in front of plaintiff's property, could not be interfered with or corrected by the Superior or Supreme Court, by an award of damages therefor; their power therein being limited to cases of fraud and oppression on the part of the authorities.—Supreme Court of North Carolina, 83 S. E. R., 655.

Fire Department—Ordinances—Administrative Board.

Fisk et al. v. City of Worcester.—The fire department of the city of Worcester, established by the city council, as authorized by City Charter (St. 1893, c. 444) § 42, authorizing the council to establish a fire department, and provide by ordinance for a chief engineer and other members of the department, is a department of the city, and the board of engineers created by ordinance is an "administrative board," within section 40, providing that the several administrative boards having charge of departments shall within their respective departments make necessary contracts, but no contract in excess of \$300 shall be valid unless approved by the mayor, and the board of engineers may make a contract for appliances for the department, but if the amount involved exceeds \$300 it must be approved by the mayor.—Supreme Judicial Court of Massachusetts, 106 N. E. R., 1025.

Performance of Ministerial Duties—Issuance of City Warrant.

Wycoff v. Strong, City Clerk.—Where a city council allows a claim and directs the city clerk to draw a warrant in payment thereof, and he refuses to do so, he may be compelled to issue and countersign such warrant by writ of mandate, as such duty is merely ministerial and requires no exercise of discretion on the part of the clerk.—Supreme Court of Idaho, 144 P. R., 341.

Vacation of Office—Abandonment.

McEvers v. Boyle, Auditor.—Where a city sealer was enjoined from performing his duties, and the city, after announcing its refusal to pay his office rent, required him to turn over the paraphernalia of the office, a letter by the sealer, referring to the "re-establishment" of the office upon dissolution of the injunction, does not show an abandonment of the office; other portions of the instrument showing that he still claimed to be the incumbent of the office of city sealer.—District Court of Appeal, First District, California, 144 P. R., 308.

Assessment of Benefits—Property Subject.

City of Springfield v. Owen.—Where, in proceedings by a city to condemn land for street widening purposes, it appeared that property south of the proposed improvement, not only was not included in the benefit district at the time its limits were fixed by the city council, but was outside the city limits, such property was not assessable for the improvement, though the city limits were afterwards extended to include it; the power vested in the courts under Rev. St. 1909, § 9266, to order a new appraisal on good cause shown, not authorizing them to make a new benefit district, the power to create which is vested by section 9262 in the city council, or to interfere, in the absence of fraud, arbitrary action, or demonstrable mistake, with the limits of the district as created.—Supreme Court of Missouri, Division No. 2, 170 S. W. R., 1118.

Officers and Boards—Civil Service—Municipal Concern.

Grobbe v. Board of Water Commissioners of City of Detroit.—The board of water commissioners of the city of Detroit was established by an act not included in the city's charter, and existed as a local corporation to serve municipal purposes. Const. 1909, art. 8, secs. 20, 21, as amended November, 1912, required the Legislature to provide a general law for the incorporation of cities, under which the electors should have power to adopt an amendment to the existing charter, and to pass all laws and ordinances relating to its municipal concerns. In accordance with Pub. Acts 1909, No. 279, as amended by Pub. Acts 1911, No. 203, and the Verdier Act (Pub. Acts 1913, No. 5), the city adopted a bill to establish a civil service system for its employees. Held, that the administrative methods of the water board were a "municipal concern," and that the bill comprehended and necessarily included the water board and its employees.—Supreme Court of Michigan, 149 N. W. R. 675.

Ordinances—Enactment—"Ministerial Officer."

Mayor, etc., of Town of Boonton v. Logan.—Act March 26, 1872 (P. L. p. 803), which is the charter of the town of Boonton, provides that the mayor shall be the chief executive, that all ordinances shall receive his approval in writing or be returned with a statement of his objections, and that no ordinance shall take effect until a certified copy shall have been laid before the mayor and shall have been approved by him, except that if he shall not return the ordinance within 14 days, it shall take effect as if approved by him. Act April 13, 1907 (P. L. p. 121), changed the municipal government of the town, providing for a councilman at large, who should be called mayor, should sign all ordinances and warrants, but should sit with the other councilmen. Held, that the councilman at large is not merely a ministerial officer, but exercises the same functions as the original mayor with respect to ordinances, and when he retained an ordinance submitted for more than 14 days, it became a law without his signature; hence in such case he should not, by mandamus, be required to sign the ordinance.—Supreme Court of New Jersey, 92 A. R. 97.

NEWS OF THE SOCIETIES

Calendar of Meetings.

Jan. 15.
AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—Annual meeting and banquet, New York, N. Y. Secretary, J. R. Wemlinger, 11 Broadway, New York City.

Jan. 18-19.
ARKANSAS ENGINEERING SOCIETY.—Fourth annual meeting, Little Rock, Ark. Secretary and treasurer, W. J. Parkes, Pine Bluff, Ark.

Jan. 19-21.
AMERICAN WOOD PRESERVERS' ASSOCIATION.—Annual Convention, Congress Hotel and Annex, Chicago, Ill. Secretary-Treasurer, F. G. Angier, care Mt. Royal Station, Baltimore, Md.

Jan. 20-22.
OHIO ENGINEERING SOCIETY.—Meeting, Brown Hall, Ohio State University, Columbus, O. Secretary and treasurer, John Laylin.

Jan. 25-27.
LEAGUE OF WASHINGTON MUNICIPALITIES.—Fifth Annual Convention, Olympia, Wash. Secretary-Treasurer, Dr. Herman D. Brauer, Univ. of Washington, Seattle, Wash.

Jan. 27-29.
ILLINOIS SOCIETY OF ENGINEERS AND SURVEYORS.—Thirtieth annual meeting, exhibit and dinner, Leland Hotel, Springfield, Ill. Secretary, E. E. R. Tratman, Wheaton, Ill.

Jan. 28-28.
WESTERN SOCIETY OF ELECTRICAL INSPECTORS.—Annual meeting, Minneapolis, Minn. Secretary, W. S. Boyd, 76 W. Monroe St., Chicago, Ill.

Feb. 9-12.
AMERICAN CONCRETE INSTITUTE.—Convention, Chicago, Ill. Secretary, E. E. Krauss, Harrison Bldg., Philadelphia, Pa.

Feb. 10-17, 1915.
EIGHTH CHICAGO CEMENT SHOW.—Coliseum, Chicago, Ill. Cement Products Exhibition Co., J. P. Beck, General Manager, 208 S. La Salle Street, Chicago, Ill.

May 10-14, 1915.
AMERICAN WATERWORKS ASSOCIATION.—Annual Convention Cincinnati, O. Secretary, J. M. Diven, 47 State street, Troy, N. Y.

June 14-16, 1915.
SOUTHWESTERN WATERWORKS ASSOCIATION.—Annual Convention, Galveston, Tex. Secretary, F. L. Fulkerson, Waco, Tex.

Sept. 20-25, 1915.
INTERNATIONAL ENGINEERING CONGRESS.—Am. Soc. C. E., Am. Inst. Min. E., Am. Soc. Mech. E., Am. Inst. E. E. and Soc. N. A. & M. E., San Francisco, Cal. Secretary, W. A. Catell, Foxcroft Building, San Francisco, Cal.

Pennsylvania League of Third-Class Cities.

City officials from 22 of the 27 cities in the league were present at the meeting held at Harrisburg Dec. 30.

The cities represented were Harrisburg, York, Wilkes-Barre, Allentown, Williamsport, Titusville, Reading, Altoona, Bradford, Chester, Corry, Easton, Erie, Franklin, Hazleton, Johnstown, Lebanon, McKeesport, New Castle, Oil City, Pittston, and Pottsville.

The question of the tenure of office occupied most of the time of the meeting. At present the mayor is elected for four years and the four councilmen for two years. The proposed change was adopted after a special committee composed of F. P. Shoonmaker, Bradford; James A. Gardner, New Castle, and Thomas C. Hare, Altoona, had reported. The amendment provides that at the 1915 election the mayor and the two highest candidates be elected for four years and the two lowest councilmen for two years. Thereafter the councilmen will be elected for four-year terms, two biennially.

The supplemental act on the initiative and referendum follows in a general way the provisions of the Clark act, clarifying the phraseology and pro-

viding that when petitions are being signed the city clerk shall not have to work on holidays and Sundays during the period the petitions must be signed.

The proposed tax act created much discussion and a proposition to provide for semi-annual payments was defeated, it being decided that the city taxes shall be payable April 1, a penalty of one per cent being provided for those who do not pay until after August 1.

Among the other important amendments which will be presented to the legislature are those:

Regulating the method by which cities may annex boroughs or adjacent parts of townships; making optional with council whether it advertise for materials or labor or do the work itself; declaring any city official, employe or councilman who shall accept any money or other valuable thing in return for a promise of political influence guilty of bribery; permitting cities to erect and operate municipal boat and bath houses.

The convention voted down a proposition to levy \$100 license tax on professional men.

American Organization of State Highway Officials.

State highway commissioners and engineers from twenty-seven states were represented at Washington, D. C., Dec. 12 at a meeting to perfect the organization. Henry G. Shirley of Maryland was elected president. The purpose of the organization is to centralize the work of good roads organizations and to procure the holding of one good roads convention annually. It also was decided to co-operate with Federal organizations in the consideration of road problems.

American Wood Preservers' Association.

The association will hold its next annual convention at the Congress Hotel and Annex, Chicago, Ill., Jan. 19-21. It is expected that a large number of delegates and visitors will attend.

Ohio Engineering Society.

The thirty-sixth annual meeting of the Ohio Engineering Society will be held in Brown Hall, Ohio State University, Columbus, O., Jan. 20-22. Preliminary business and the meeting of officers, trustees and committees will open the session at 10 o'clock on Jan. 20. The real business of the day will begin with the afternoon session, which opens at one. President Thompson, of Ohio State and president Kennedy of the Society, will give talks. The following papers will be presented: "Enclosing a Stream Through the City of Mansfield, Ohio," by Charles L. Bushey, Mansfield, Ohio; "An Experiment in Reinforcing a Concrete Road," by F. J. Stinchcomb, County Surveyor,

Paulding, Ohio; "Standard Signals for Field Engineers," discussion opened by Samuel P. Baird, member American Society of Civil Engineers, Columbus, Ohio. The report of the legislative and appointment of the nominating committees will follow. There will be no evening session.

A. S. Rea, testing engineer, will give a laboratory demonstration from half-past eight until half-past nine Thursday morning. At the latter hour, the regular morning session will commence. Four interesting papers will be read:

"Wire-Cut-Lug Brick," William C. Perkins, Civil Engineer, Conneaut, Ohio; "Culvert Design," P. K. Sheidler, Ohio State Highway Department; "Looking Into Some of Our Brick Roads," D. Moomaw, Road Engineer, Cuyahoga County, Cleveland, Ohio; "A Recent Public Utility Franchise," Charles C. Brown, Municipal Engineering Magazine, Indianapolis, Indiana.

The report of the nominating committee will be received during the afternoon session and the election of officers will follow. Papers will then be presented as follows: "Plan and Work—The Relation of the Engineer to Each and Both," by Will P. Blair; "The National Road," by J. T. Voshell, U. S. Engineer; "Four Years in the State Highway Department," by James R. Marker, State Highway Commissioner. At the evening session at half-past seven illustrated papers on "Sewerage Treatment Station and Garbage Reduction Work at Columbus, O.," and "Columbus Water Purification Works" will be delivered by Professor F. H. Eno, Ohio State University.

The county surveyors and surveyors-elect will hold a meeting Friday morning, while the society is listening to the report of the secretary-treasurer and trustees and taking care of the unfinished business.

The officers are: Frank M. Kennedy, president; Wm. F. Schepflin, vice-president; John Laylin, secretary-treasurer. The legislative committee consists of Clifford Shoemaker, Professor C. E. Sherman, Ed. Hazeltine, A. R. Taylor and J. I. Hudson.

PERSONALS

Baune, F. A., mayor of Floodwood, Minn., has resigned and Garfield formerly employed by the city of Blackwood has been appointed mayor.

Bedell, J. Ferrie, mayor of Charleston, W. Va., has resigned. O. A. Petty, a member of the board of control, succeeds to the position automatically.

Breed, H. E., of Brooklyn, has been appointed by State Engineer-elect F. M. Williams as terminal engineer on the barge canal. The position pays \$6,000 a year. The following were appointed division engineers at \$4,200 per year: George D. Williams, Guy Moulton, Friend Williams.

Brown, W. H., and Murphy, R. H., have been reappointed as police com-

(Continued on page 52.)

NEW APPLIANCES

TWO-WHEEL TRACTOR.

For Fire Apparatus.

The Robinson two-wheel tractor, No. 2, is of the latest approved design and constructed to achieve symmetrical proportions and efficient distribution of load. The motor is heavy and powerful and the bearings throughout are large. Lubrication is mechanical to each bearing and cylinder and does not depend on splash feed and a constant oil level in the crank case. The engine develops 70 brake h. p.—abundant for hill-climbing and pulling on bad roads. The apparatus makes a speed of 25 miles an hour on safe gearing.

The motor consists of four cylinders, vertical type, cast in pairs, $5\frac{1}{4}$ -inch bore and $5\frac{3}{4}$ -inch stroke; the valves are large. The ignition is given by two independent and complete systems, making the motor positive at all times. The carburetor is of special automatic construction, furnishing the correct mixture at all speeds. The throttle is controlled by a hand lever on the steering post and foot accelerator. Cooling is by an extra large circulating pump and a large square tube radiator.

The transmission gives three speeds and reverse. The gears and shafts are all made of nickel steel and the differential jack shaft and all parts of the transmitting mechanism are made of specially treated metal. Sliding gears have been eliminated in the design. The gears remain in mesh at all times, engagement being made by sliding positive clutch on the squared shaft. An automatic lock prevents the engagement of two speeds at the same time. The drive is by double chain to sprockets or pinion shafts, the power being transmitted by a bevel gear on steering pinions—universal joints being eliminated. The clutch is powerful, being demountable cone leather faced.

The frame is of high grade channel steel lined with hickory. The springs are made of special-heat treated vanadium steel. The tires are rubber cushion, 38 x 6 inches. The equipment includes one large 10-inch search light and two driving lamps.

This two-wheel tractor is by the Robinson Fire Apparatus Mfg. Co., 4250-4268 North 20th street, St. Louis, Mo. The illustration shows a Robinson two-wheel front-drive tractor in service at Boston, Mass.

THE KINKLESS HOSE ATTACHMENT.

The use of hose on sprinkling and flushing wagons is usually subject to various annoyances due to kinking of the hose, the developing of troublesome leaks and unnecessary handling of hose. The Kinkless hose attachment, designed to overcome the diffi-

culties, consists essentially of two swinging joints and a two-inch pipe. With this attachment, it is claimed that only half the amount of hose ordinarily needed is enough. The attachment can be used on any tank, and with proper adjustment and ordinary care it is calculated to last many years. When not in use the hose lies on a narrow board, 4 inches wide, running on an incline at the side of the tank and held on small brackets so that the hose is kept straight and drained at all times. The attachment is held in place by a clip and four nuts fastened to the tank and located at swinging joint A.

The entire equipment consists of the two swinging joints and the clips for holding them. The illustrations show the attachment not in use, with the hose at the side of the tank and also the attachment in use, showing the tank being filled from the hydrant. The Kinkless hose attachment is made by E. L. Ginskey, 1026 Tyler street La Crosse, Wis.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago—At Cincinnati, O., the U. S. Cast Iron Pipe & Foundry Co. took 2,400 tons of 36-inch pipe and the city has opened bids on an additional 1,000 tons. Quotations: 4-inch, \$25.50; 6 to 12-inch, \$23.50; 16-inch and up, \$23. Birmingham—Local foundries seem to have obtained good proportion of lettings. Quotations: 4-inch, \$20; 6-inch and up, \$18. New York—No new municipal lettings of importance announced. Conditions for this year look more promising than during last. Prices not changed. Quotations: 6-inch, \$20 to \$20.50.

Lead.—Quotations: New York, \$3.80; St. Louis, \$3.60.

The De Laval Steam Turbine Co., Trenton, N. J., is distributing a very

complete publication devoted solely to centrifugal pumps. This book of 298 pages contains over 300 illustrations, including centrifugal pumps for all capacities and heads, and for motor and steam turbine drives, diagrams showing the "characteristics" of such pumps and explaining the relations between impeller blade angles and characteristics; interior views and views of parts showing the construction; views showing the method of manufacture by the use of limit gages and methods of testing; installations of pumps for various services; also numerous illustrations of the DeLaval reducing gear employed to allow electric motors, water turbines, steam engines and steam turbines to operate at the most economical speed when driving a centrifugal pump. The text matter is divided into chapters under such headings as "The Introduction of the Centrifugal Pump and the Work for Which It Is Adapted;" "Features to Be Considered in Selecting Centrifugal Pumping Equipment;" "The Use of the Characteristic Curve;" "Methods of Testing Centrifugal Pumps;" "Details of Design and Construction of Single-stage and Multi-stage Pumps;" "The Speed Question, Particularly Relating to Steam Turbine Driven Centrifugal Pumps;" "Helical Speed Reducing Gears;" "Motor and Belt Drives;" "High Duty Steam Turbine Driven Pumps as Compared with Reciprocating Pumping Engines for Water Works Service." Tables and charts are given for determining the resistance of pipes and the relation between heads and spouting velocities. The investigation of the pumping problem, together with drawing up of specifications for centrifugal pumps, are also treated at some length. The chapter on "Water Works Pumps" explains that under many conditions the centrifugal pump can handle water at a cost 20 to 40% lower than it can be handled by reciprocating pumps, because of the lower fixed charges.



ROBINSON NO. 2 TRACTOR.

The Pittsburgh Meter Co., Pittsburgh, Pa., has sold to the water department of Norfolk, Va., several thousand of their meters.

The F. D. Cummer & Son Co., Cleveland, O., have just been awarded a contract by the borough of the Bronx, New York City, for a Cummer road plant to be erected ready for operation in the early spring. The plant will have a guaranteed capacity of 750 square yards of 2 inch top, asphalt macadam or Topeka mix per day.

The International Motor Co., West End Ave. and 64th St., New York City, announces that it has just received an award from the New York Fire Department for 20 Mack high pressure hose wagons. The city has now a total of 73 pieces of Mack fire apparatus of various types supplied by the company within the last 2½ years. The Bureau of Highways, Department of Public Works, has purchased six 5-ton Saurer tractors from the International Motor Co., to be used in connection with the municipal asphalt plant at 90th street and East River on the repair of asphalt streets.

Pawling and Harnischfeger Co., Milwaukee, Wis., has issued a very tastefully produced book entitled "Thirty Years of Progress: 1884-1914." It relates the history in detail of the company; the growth of its operations and the development of its products. Pawling & Harnischfeger Co. manufacture a large variety of machinery—principally cranes and hoists. In the last year several new types have been developed, including the new type "U" electric hoist, the new type "H" crane and a line of excavating machinery. The book is beautifully printed and handsomely illustrated with numerous pictures of plant, company offices and products.

PERSONALS

(Continued from page 50.)
missioners at Bridgeport, Conn.; other appointments included J. A. Leonard and C. G. Lindquist as members of the fire board.

Bullard, Dexter, for 30 years water commissioner of Spencer, Mass., died at his home in that city, Dec. 9, aged 99 years.

Thomas J. Canavan, commissioner of public works and president of the Board of Local Improvements, has resigned his office.

Carmichael, I. J., has been appointed city clerk of Erie, Pa.

Creamer, J. Wesley, has been reappointed marshal of police of Baltimore county, Md.

Emerson, W. W., has resigned as member of the Haverhill, Mass., park commission.

Hill, John W., of Cincinnati, will resign soon as a member of the Ohio State Board of Health, owing to a pressure of private work.

Ingram, Thomas, mayor of Grass Valley, Cal., has resigned, but the city council has not yet accepted the resignation.

Jackson, Edward, has been appointed chief of police of Baker, Oregon. Other appointments include James Cuning, city clerk, and F. H. Grabner, fire chief.

Lehan, Patrick J., city marshal of Salem, Mass., has resigned on account of ill health.

Lobecker, C. F., has been chosen as city clerk of Grass Valley, Cal., succeeding E. H. Armstrong, who has been elected district attorney.

Morris, C. H., has been elected superintendent of the New Brunswick, N. J., water department.

Newell, M., was recommended by the retiring chief as his successor in the Maysville, Ky., fire department. He will be appointed later.

Orbison, Robert V., has been elected to the office of city engineer of Pasadena, Cal., to succeed the late L. E. Smith.

Ryder, Irving L., city engineer of San Jose, Cal., has offered his resignation to take effect Jan. 1. Milton Maggini has been appointed to take his place.

Shaw, Dr. F. E., died Nov. 29, at Sacramento, Cal. At the time of his death he held the office of commissioner of finance.

Shirley, Capt. Thomas, has been elected assistant to chief of police Eagan of Birmingham, Ala.

Smith, Lewis E., former city engineer of Pasadena, died at that place December 18, after an illness of two years. He was 34 years old.

Smith, F. P., of Dow & Smith, consulting paving engineers, sailed Dec.

30 for London, where he has been called to serve in a consulting capacity concerning city pavements.

Stewart, O. E., superintendent of the High Point, N. C., electric light department, has resigned. He will be succeeded by L. C. Gidney, of Rutherfordton.

Troxell, Raymond B., has been elected chief of the Morristown, N. J., fire department. Charles H. Snudden and Vincent Roache were appointed assistants.

The firm name of Hazen & Whipple has been changed to Hazen, Whipple & Fuller. C. M. Everett, for eight years an employe of the company, has also been admitted to partnership. The change was made on the twentieth anniversary of the founding of the firm.

Usry, R. M., has been appointed chief of police of Groesbeck, Texas, succeeding H. H. Buttes, resigned.

Wainwright, A. F., one of the pioneers in the oil and asphalt business, died at Northport, L. I., Dec. 21, aged 71.

Whipple, E. E., and Currier, J. B., have been elected to the board of fire engineers of Haverhill, Mass.

White, Peter, an expert accountant Bridgeport, Conn., died in Chicago last week.

Williams, E. S., has been appointed commissioner of fire and police, Rome, N. Y.

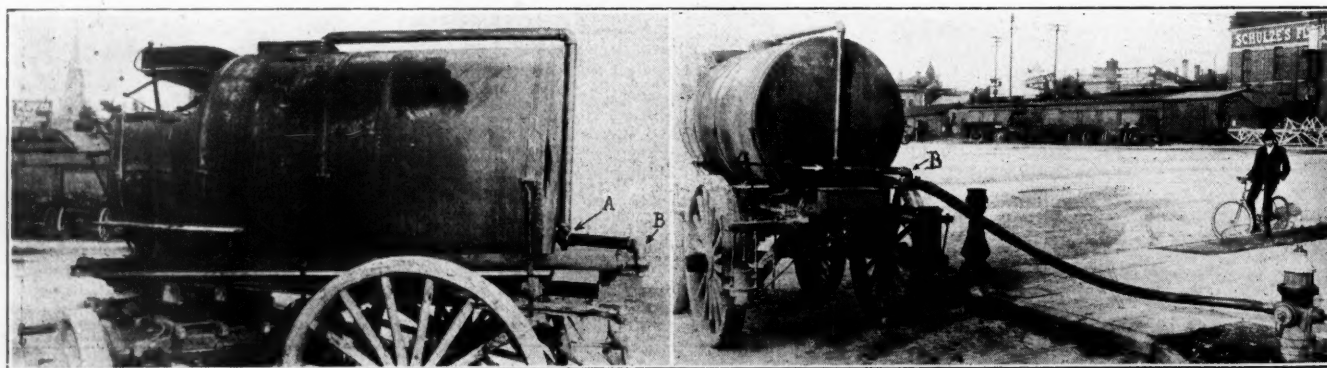
Wood, W. W., for more than four years superintendent of the water and light plant at Horton, Kansas, has been elected for another year. He is also serving as city clerk.

Among the appointments at Athens, Ga., are L. E. Brooks, chief of police, G. W. McDorman, fire chief, and W. L. Wood, clerk and treasurer.

The following officials have been elected:

Portland, Me.—F. P. Kelly, city auditor; H. T. Waterhouse, city clerk; F. S. Jordan, city treasurer; J. A. Connellan, city solicitor.

Tucson, Arizona.—J. K. Corbett, mayor; L. O. Cowan, city recorder; James Cullen, city marshal; Byrd Brooks, treasurer; J. E. Woods, assessor; G. T. Fisher, W. J. Wakefield and J. P. Hohusen, councilmen.



THE KINKLESS HOSE ATTACHMENT.

ADVANCE CONTRACT NEWS

ADVANCED INFORMATION BIDS ASKED FOR

CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS.				
N. J.	Chesterfield	Jan. 16	Two miles bituminous macadam road	Township Committee
O.	Marion	Noon, Jan. 16	Regrading and resurfacing road	Comrs. Marion County.
Ind.	Lebanon	1 p.m., Jan. 18	Grading, draining and graveling road	Bd. of Comrs. of Boone Co.
R. I.	Providence	2.15 p.m., Jan. 18	500,000 improved granite blocks and 100,000 ordinary paving blocks	Board Contract & Supply
Minn.	St. Paul	10 a.m., Jan. 18	Grading and improving streets	Aug. Hohenstein, Pur. Agt.
Ind.	Indianapolis	10 a.m., Jan. 18	Curbing and paving, five jobs	Board Public Works.
N. J.	Camden	8 p.m., Jan. 18	Repair of brick and cement sidewalk, furnishing one or two sand dryers	A. B. Sparks, Chr. Committee Streets and Highways.
N. J.	Bridgeton	10 a.m., Jan. 18	.974 miles gravel road	Road Committee, Bd. Chosen Freeholders.
N. Y.	Albany	3 p.m., Jan. 18	Asphalt pavement repairs, broken stone and road oil	Isadore Wachsmann, Secy. Bd. Contract & Supply.
Mo.	St. Louis	Noon, Jan. 19	500 tons asphaltic cement	Supply Commissioner.
Mont.	Great Falls	Jan. 19	Concrete sidewalks and curbs	W. H. Harrison, City Clk.
Md.	Baltimore	Jan. 19	1½ miles of sheet asphalt on bridges	State Roads Commission
Md.	Baltimore	Noon, Jan. 19	10.56 miles (5 sections) state highway	State Roads Commission
O.	Shaker Heights, Cleveland	Noon, Jan. 19	Curbing, draining and paving streets	C. A. Palmer, Vil. Clk.
Tex.	Sulphur Springs	Jan. 19	35,000 sq. yds. paving; 20,000 ft. concrete curb, 12,000 cu. yds. earth excavation	A. D. Stivers, City Engr.
Mont.	Great Falls	8 p.m., Jan. 19	Concrete sidewalk and curbing for 1915	W. H. Harrison, City Clk.
Cal.	Manhat'n Beach	7.30 p.m., Jan. 20	Improving streets	M. M. Murray, City Engr.
N. Y.	New York	2 p.m., Jan. 21	Street improvement at Market under Williamsburg Bridge spaces	President, Boro. Manhattan.
D. C.	Washington	2 p.m., Jan. 22	4.5 miles experimental road construction	Office of Public Roads.
Tex.	San Antonio	11 a.m., Jan. 22	.71 miles gravel roads	W. A. Crossland, U. S. Senior Highway Engr.
Ind.	Muncie	10 a.m., Jan. 23	Two miles gravel road	Comrs. of Delaware & Henry Counties.
O.	Ashtabula	Noon, Jan. 23	Paving with shale block; cost about \$44,780	M. H. Turner, Dir. P. S.
Minn.	Ada	Jan. 25	Road construction	D. E. Fuller, Aud.
Ind.	Danville	10 a.m., Jan. 25	Road improvements	L. W. Borders, Aud. Henricks Co.
Mich.	Flint	Jan. 27	110,000 sq. yds. of brick, sheet asphalt, asphalt block, bitulithic and wood block pavements	E. C. Shoecraft, City Engr.
Tex.	Greenville	Jan. 27	Construction of a system of improved highways	Bd. of Permanent Rd. Comrs., Road Dist. 1, Hunt Co.
Ky.	Louisville	Jan. 28	Paving with bituminous concrete, cost \$8,000	Board Public Works.
Ind.	New Albany	8 p.m., Jan. 28	Making and repairing cement sidewalks	Board Public Works.
O.	Mt. Gilead	11 a.m., Jan. 29	.77 miles road improvements, two jobs	Comrs. Morrow Co.
La.	New Orleans	Noon, Jan. 30	.27 miles gravel road	W. E. Atkinson, State Hwy. Engr.
N. Y.	Brooklyn	11 a.m., Jan. 30	Grading, curbing and laying sidewalks, also 2,000 tons stone dust	L. H. Pounds, Boro. Pres.
Wash.	Chehalis	Feb. 1	Two miles 16-ft. concrete road	County Commissioners
Ind.	Greenfield	10 a.m., Feb. 1	Grading, paving and improving road	L. Wood, Aud. Hancock Co.
Ind.	Indianapolis	10 a.m., Feb. 3	Gravel road construction	Bd. of Comrs. Delaware Co.
Ore.	Bay City	Feb. 4	Improving streets by grading, paving, curbing and constructing sidewalks, estimated cost \$35,000	City Recorder.
Wash.	Chehalis	Feb. 6	Mile cement road	City Clerk
Ia.	Marshalltown	Feb. 15	Paving	City Clerk
O.	Upper Sandusky	Mar. 1	Fifteen miles water bound macadam	J. Megurat, Aud., Wyandott Co.
SEWERAGE.				
N. Y.	Jamestown	Jan. 16	Sewer pipe and cement	Bd. of Estimate & Review.
Ind.	Indianapolis	10 a.m., Jan. 18	Sewer construction	Board of Public Works.
Minn.	Sandstone	Jan. 18	Constructing sewer system	Village Recorder
R. I.	Providence	2.15 p.m., Jan. 18	Sewer construction	Board Contract & Supply
Minn.	Sandstone	8 p.m., Jan. 18	9,000 ft. 6 to 10-inch sewer. 34 manholes	Chris. Rudisuhle, Co. Rec.
Wash.	No. Yakima	10 a.m., Jan. 18	Laying 100 ft. of 60-in. reinforced concrete pipe	R. B. Hopper, City Clk.
Ind.	Richmond	10 a.m., Jan. 18	Construction of relief sewer	Board Public Works.
O.	Shaker Heights, Cleveland	Noon, Jan. 19	Storm and sanitary sewer construction	C. A. Palmer, Vil. Clk.
Ga.	Augusta	Noon, Jan. 19	Brick and reinforced concrete sewer	City Council.
N. Y.	New Brighton	Noon, Jan. 19	Construction of combined sewer and receiving basin	C. J. McCormack, President.
Mont.	Browning	2 p.m., Jan. 20	Concrete piers for steel pressure pipe	U. S. Reclamation Service
Ill.	Peoria	9.30 a.m., Jan. 20	Construction of ditches and diversion channels	J. H. Best, Quincey, Ill.
Mass.	Boston	Noon, Jan. 20	Sanitary work on hospital	Bd. of Trustees, Hosp. Dept.
O.	Ada	Noon, Jan. 21	Street sewer construction	Frank Dietrick, Clk. VII. Coun.
Ind.	Waterloo	7 p.m., Jan. 21	Storm sewer and septic tank	W. R. Newcomer, Town Clk.
Mass.	Boston	Noon, Jan. 21	Dorchester Brook sewer	L. K. Rourke, Comr. P. W.
Mass.	Boston	Noon, Jan. 22	Manhole and catch basin frames, grates, covers and other castings	D. F. Dougherty, Supt. Sup.
Wash.	Puget Sound	10 a.m., Jan. 26	Terra cotta tile	S. McGowan, Washington, D.C.
Ill.	Rockford	11 a.m., Jan. 27	17,081 ft. 9-inch sewer pipe; 11,492 ft. 10-inch; 30,000 ft. 12 to 33-inch; 49 manholes; 41 combination manholes; 33 lampholes and 10 flush tanks	President, Bd. Local Imp.
Minn.	Stillwater	Jan. 29	Drainage ditch, cost about \$14,750	N. A. Nelson, Co. Aud.
Mont.	Roundup	Feb. 1	Main sewer and disposal plant	City Engineer
Ind.	So. Bend	Feb. 1	Sewer construction	A. P. Perley, Clerk
Tex.	Dallas	8 p.m., Feb. 1	Units of disposal plant	R. R. Nelms, Water & S. Com.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
D. C.	Washington	10 a.m., Feb.	2.. Cast iron soil pipe and fittings, sewer pipe and plumbing fixtures	S. McGowan, Paymaster-General, U. S. N.
La.	Gonzales	Feb.	4.. Drainage canal construction	Len Picard, New River Drainage Dist., President
Minn.	Dumont	8 p.m., Feb.	26.. 1,400 ft. sewer construction	J. R. Heidelberger, Vil. Rec.
O.	Upper Sandusky	Mar.	1.. Ten ditches 40,000 ft. long, 8 to 24-inch tile	J. Megurat, Aud. Wyandotte Co.

WATER SUPPLY.

Kan.	Larned	Jan.	18.. Two motor driven turbine pumps and other equipment	L. D. Burgess, City Clk.
Man.	Winnipeg	Jan.	18.. Machinery for gravel pit excavation, screening, elevating and crushing machines and locomotives and cars	S. H. Reynolds, Chr. of Comm. City Council.
Fla.	Tarpon Springs	7 p.m., Jan.	18.. 50 h.p. Diesel engine, 500 gal. Triplex pump	
Cal.	Glendora	Jan.	18.. 28,500 lin. ft. 8, 6 and 4-in. riveted steel pipe; 31,500 ft. wrought iron pipe; 90 8 to 2-in. standard straightway gate valves; 12 4-in. double outlet fire hydrants; also construction of water works building	F. S. Dessery, City Engr., Central Bldg., Los Angeles.
Minn.	St. Paul	10 a.m., Jan.	18.. Stop boxes, valve boxes, gate valves & special castings	Aug. Hohenstein, Pur. Agt.
N. Y.	Albany	2 p.m., Jan.	18.. Cast iron pipe and specials, hypochlorite and aluminum sulphate	Isadore Wachsmann, Secy. Bd. Contract & Supply.
O.	Shaker Heights, Cleveland			
P. O.		Noon, Jan.	19.. Water mains in streets	C. A. Palmer, Vil. Clk.
Tex.	Sweetwater	Jan.	20.. Six miles gravity conduit; steel standpipe and water works	Geo. T. Wilson, Mayor
Ariz.	Phoenix	4 p.m., Jan.	20.. Two motor-driven centrifugal pumping units	W. A. Farrish, City Mgr.
Mass.	Boston	Noon, Jan.	20.. Iron castings	D. F. Dougherty, Supt. Sup.
O.	Columbus	Noon, Jan.	21.. Cast iron pipe and special castings	Director Public Service.
Mo.	St. Louis	Noon, Jan.	22.. 20 million gallon steam turbine driven centrifugal pump	Board Public Service.
Ill.	Joliet	Feb.	1.. Reservoir construction	Henry Odenthal, City Clk.
Pa.	Philadelphia	Noon, Feb.	9.. Sedimentation basins and 36 and 48-inch c. i. pipe and specials	Director Public Works, Bureau of Water.
Greece	Athens	1915, Mar.	30.. Water supply for Athens and additional cities, estimated cost, \$14,000,000	Bur. of Foreign & Domestic Commerce, Wash., D. C.

LIGHTING AND POWER.

Conn.	Waterbury	Jan.	16.. Boiler house and steam heating plant	L. A. Walsh, Architect
Kan.	Topeka	2 p.m., Jan.	16.. Incandescent electric lamps, Mazda and tungsten	State Board Control
Kan.	Larned	Jan.	18.. Electric light and power plant and water works	L. D. Burgess, City Clk.
N. Y.	New York	11 a.m., Jan.	18.. Incandescent electric lamps	Wm. Williams, Comr.
Cal.	Los Angeles	2 p.m., Jan.	18.. Street lighting in Norwalk district	County Bd. Supervisors.
Ill.	Chicago	Noon, Jan.	20.. Incandescent lamps for one year	South Park Comrs.
Mass.	Boston	Noon, Jan.	20.. Electric work at hospital	Bd. of Trustees, Hosp. Dept.
Ill.	Carbondale	2 p.m., Jan.	21.. Power plant for State Normal	J. B. Debelka, 29 S. La Salle St., Chicago.
O.	Cleveland	Noon, Jan.	22.. Lead covered cable and electric meters	A. R. Callow, Comr. Pur. & S.
O.	Toledo	10 a.m., Jan.	29.. Light, heat and power plant	Board Comrs., Lucas Co.
W. Va.	Wheeling	11 a.m., Jan.	30.. Steel lock gates for Ohio River dam No. 15	U. S. Engineer.
La.	Harrisonburg	Feb.	5.. Concrete dam, cost \$200,000	Maj. J. R. Slattery, Box 221, Vicksburg, Miss.

FIRE EQUIPMENT.

Mont.	Columbus	Jan.	18.. 500 ft. hose and reel for same	Geo. A. Westover, City Clk.
Minn.	St. Paul	10 a.m., Jan.	18.. 130 fire hydrants	Aug. Hohenstein, Pur. Agt.
Tex.	Sweetwater	2 p.m., Jan.	20.. 50 fire hydrants	G. T. Wilson, Mayor
Ill.	Chicago	Noon, Jan.	20.. 40,000 ft. 1-inch rubber hose	South Park Comrs.
Cal.	Los Angeles	Jan.	20.. Fire apparatus	City Council
N. D.	Fargo	5 p.m., Jan.	26.. 500 ft. cotton hose, 300 ft. rubber hose	City Comrs.
O.	Youngstown	noon, Feb.	3.. Installation of material for fire and police telegraph system	Dept. Public Safety.
Ind.	Lafayette	Feb.	10.. Fire hose and reconstruction of motor apparatus	Board of Works.

BRIDGES.

N. Y.	Wawarsing	11 a.m., Jan.	16.. Steel highway bridge 197 ft. long	S. S. Shurter, Supt. Highways
Neb.	Wayne	Noon, Jan.	19.. Steel or corrugated culvert	C. W. Reynolds, Co. Clk.
Md.	Baltimore	noon, Jan.	19.. Two reinforced concrete bridges	State Roads Commission
Neb.	Wayne	Noon, Jan.	19.. 18 to 60-in. corrugated culverts	C. W. Reynolds, Clerk.
Ont.	Ottawa	Jan.	21.. Substructure of direct lift bridge	F. C. Askwith, Act. City Engr.
Neb.	Kearney	Jan.	25.. 46-foot steel arch bridge	City Clerk
Ill.	Pecatonica	2 p.m., Jan.	27.. Two reinforced concrete bridges	H. Schreider, Town Clk.
Ont.	Ottawa	Jan.	28.. Substructure of Pretoria Ave. bridge	City Council.
Kan.	Salina	Feb.	1.. A \$30,000 conc. bridge over Smoky river at Iron Ave.	County Commissioners
Wash.	Chehalis	Feb.	3.. Three steel bridges, one wooden bridge & one trestle	County Commissioners
O.	Columbus	Noon, Feb.	5.. Approaches to bridge: concrete bridge over Indian Run	Board County Comrs.
Minn.	Fairbault	Feb.	10.. Two bridges and one culvert	City Clerk.
S. D.	Elk Point	Mar.	2.. Bridge construction in 1915 (readvertisement)	Edward Holden, Co. Auditor
Wis.	Racine	Mar.	15.. Steel bridge	Comrs. Racine County

MISCELLANEOUS.

O.	Cincinnati	Jan.	16.. Six-story court house, cost \$2,500,000	Geo. O. Deckebach, Secy.
Okla.	Oklahoma City	10 a.m., Jan.	16.. 8,000 cu. yds. rock; 4,000 cu. yds. sand; 13,500 bbls. cement and 850 tons reinforcing steel	State Capitol Commission.
Mich.	Lansing	Jan.	16.. Collection and disposal of garbage	John McClelland, City Clk.
Ky.	Louisville	noon, Jan.	18.. 8,000 metal license plates	Comrs. Sinking Fund
Ill.	Chicago	11 a.m., Jan.	18.. Brass and copper	F. E. McGann, Comr. P. W.
N. Y.	Albany	3 p.m., Jan.	18.. Removal of street dirt and rubbish; lead arsenate	Isadore Wachsmann, Secy. Bd. Contract & Supply.
N. Y.	New York	10.30 a.m., Jan.	18.. 12,000 gals. automobile naphtha	D. Mathewson, Pres. Bronx.
N. Y.	Albany	4 p.m., Jan.	18.. Automobile truck and body	State Armory Commission.
Mo.	St. Louis	Jan.	19.. Sprinkling streets	Board Public Service.
N. Y.	New York	11 a.m., Jan.	19.. 8,000 sq. ft. face cutting of stone for Kensico dam	Board of Water Supply
Minn.	Minneapolis	3 p.m., Jan.	19.. Remodelling of Custom House	O. Wenderoth, Washington, D. C.
N. Y.	Binghamton	2.30 p.m., Jan.	21.. Boiler and stack at state hospital	State Hospital Commission.
N. Y.	New York	Noon, Jan.	21.. Metal and canvas parts for street cleaning carts	Albany, N. Y.
D. C.	Washington	2 p.m., Jan.	22.. Post Office at Uvalde, Tex.	J. T. Fetherston, Comr. Street Cleaning.
Mass.	Boston	Noon, Jan.	22.. Collecting and removing ashes and refuse	O. Wenderoth, Wash. D. C.
Kan.	Leavenworth	2 p.m., Jan.	23.. 4,000 bbls. cement	F. K. Rourke, Comr. Pub. Wks.
Tex.	Dallas	10 a.m., Jan.	23.. Furniture for Court House	F. H. Duehay, Supt. Prisons, Washington, D. C.
Neb.	McCook	2 p.m., Jan.	26.. U. S. Postoffice	C. E. Gross, Co. Aud.
				O. Wenderoth, Washington, D. C.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Pa., Wilkes-Barre.....	Noon, Jan. 29..	200 two-way street signs; 400 single street signs.....	City Clerk	
Kan., Chanute	Jan. 29..	Construction complete of U. S. Postoffice.....	O. Wenderoth, Washington, D. C.	
Fla., Bartow	midnight, Jan. 31..	Construction of city hall.....	City Council.	
D. C., Washington.....	Feb. 1..	Public building, cost \$200,000.....	S. W. Stratton, Dir. Bureau of Standards.	
N. Y., Cleveland	Noon, Feb. 2..	Harbor dock wall and two breakwaters.....	Supt. Public Wks., Albany.	
Utah, Payson	2 p.m., Feb. 3..	Drainage work	U. S. Reclamation Service, Provo, Utah.	
Pa., Philadelphia	Noon, Feb. 15..	Two remote control electric winches.....	Geo. W. Norris, Director Dept. Wharves, Docks & Ferries.	
Ont., Toronto	Feb. 16..	Furnaces and appurtenances for refuse incinerating plant.....	Chairman, Board Control.	
D. C., Washington.....	11.30 a.m., Feb. 24..	Valves and accessories for dry dock.....	Maj. F. C. Boggs, Gen. Pur. Officer.	
Mont., Miles City.....	3 p.m., Feb. 27..	U. S. post office.....	O. Wenderoth, Washington, D. C.	
Okla., Lawton	3 p.m., Mar. 6..	U. S. post office.....	O. Wenderoth, Washington, D. C.	

STREETS AND ROADS

Alaska.—Plans are being considered for development of system of roads.

Helena, Ark.—City will pave eight additional streets.

Colusa, Cal.—The Anglo and London-Paris National Bank of San Francisco was successful bidder for Colusa State highway bonds, their bid being \$106,872.20 and accrued interest to date of delivery. Bonds sold amounted to \$116,000, leaving \$9,128 deficit to be made up by county.

Jackson, Cal.—Mass meetings are being held to urge citizens of Amador, Calaveras and San Joaquin Counties to support movement for construction of state highway through three counties. Proposed road would connect mountain sections with San Joaquin Valley and Alpine improved roads with San Joaquin Valley, making it possible for automobile drivers to reach Lake Tahoe and mountain resorts without leaving improved roads.

Lakeport, Cal.—The Lake County Supervisors, at a special meeting, passed strong resolutions endorsing the proposed Yolo-Lake State Highway. The movement is a resumption of an effort made at the last session of the State Legislature to build a highway from Capay, Yolo County, up Cache Creek Canyon, to the town of Lower Lake, Lake County. A bill to be presented at the coming session of the Legislature will provide for an appropriation of \$75,000.

Los Angeles, Cal.—Improvement of large number of streets is being planned.

Nevada City, Cal.—At Chamber of Commerce meeting it was decided in petition Supervisors to lay out new road in vicinity of Lake Vera, five miles from this city. Present road in winter time is impassable. The matter will be brought before Supervisors at their meeting next week.

Placerville, Cal.—Mass meeting of citizens of Placerville will be called in near future to consider question of paving Main St. for distance of two miles, estimated cost of which is \$13,000.

San Francisco, Cal.—Board of Works has asked Supervisors for \$8,000 for civic center improvements, \$6,000 being for sidewalks and \$2,000 for fences.

San Francisco, Cal.—The permanent improvement of 46th Ave., between Geary and Anza Sts., at an estimated cost of \$7,400, has been ordered.

Yuba City, Cal.—Construction on 11½ miles of State highway in Sutter county will be started early next week. Road will run from Yuba City, via Live Oak, to the Butte county line, and will be built at a cost of \$42,382. This will be the first stretch of State highway in Sutter county. Supervisors are also expected to again revive proposition of bonding county for \$250,000 in order to build permanent road from Yuba City to Riego, including bridge at Nicolaus.

Yuba City, Cal.—Work will be commenced shortly on construction of State highway, which will connect this city with Butte County and will be link of highway to be built this year to connect four counties, Sacramento, Placer, Sutter and Butte. Plans and specifications for construction of highway are now being considered. Road, on which work will commence soon, will stretch for 11.7 miles through richest section of Sutter County. Lateral to be constructed now by State Highway Commission will cost \$42,381.10, according to contract, which has been awarded to San Francisco contractors. It provides for road with concrete base and wearing surface of asphaltum. County Board of Supervisors has secured right of way in places where the new road does not follow the old county road, and will also furnish small bridges and culverts. Highway will be ready for use within a year. Bonds were sold in sum of \$100,000 recently to cover cost of the work. Within next few weeks Board of Supervisors will call bond election to submit proposition of bonding county for \$270,000 to provide for lateral to connect with State highway from this city to Butte County, by direct road to Riego at junction of Sutter, Sacramento and Placer Counties, a distance of 38 miles. This road would connect in turn with highway to Sacramento at Riego and provide direct road from Butte County through Sutter to capital city. Proposed highway from Riego north will mean that bridge costing about \$150,000 must be constructed over Feather River at Nicolaus. Cost of construction of the road is estimated at \$120,000, this to include roadbed of macadam for entire length.

Bridgeport, Conn.—Widening of Congress St. is favored, also improvement of Knowlton St.

Wilmington, Del.—City Council, as committee of the whole, has considered subject of street paving, and at conclusion of session it was decided to borrow \$400,000 for such improvements.

Wilmington, Del.—Plans for issuance of \$750,000 of bonds by State of Delaware for construction of highway to connect with Pennsylvania and Maryland lines at northern and southern borders of State, are being prepared by Delaware Automobile Association, unattached autoists and progressive farmers of this county.

Tampa, Fla.—Hillsborough county awarded contracts for 11 miles of road improvement.

Tampa, Fla.—City will pave about 24 streets, amounting to about 65,000 sq. yds.

Tavares, Fla.—Bids received on Dec. 31 for street paving have been rejected and new bids will be readvertised in about 60 days.

Titusville, Fla.—City invites bids to construct 3,065 ft. of roadway on Main St.

Elwood, Ind.—Fearing that it would be found impossible to improve streets as proposed by assessment plan, property owners of North 12th and South 18th Sts. have now changed their plans and will petition County Commissioners to have the streets paved with concrete under the three-mile road law. Council has already passed favorably upon such a petition.

Fort Wayne, Ind.—With list of 31 petitions for street pavements, the Board of Works is confronted with necessity of selecting jobs to be done during coming season. Those streets will be picked that have fewest number of street intersections, all other things being equal. Of course there are some of streets petitioned for that so urgently need improvements that it will be necessary to pave them even if street intersection cost is high. City has but \$20,000 available this season for city's portion of paving campaign.

Lafayette, Ind.—Board of County Commissioners have received bids on Rynearson Road in Wayne Township. J. Archie Peterson, of West Point, was lowest bidder, his price being \$6,650. His bond was not large enough to meet requirements and board will be forced to readvertise for bids. There were seven other contractors bidding for the work.

Richmond, Ind.—See "Sewerage."

Cedar Falls, Ia.—Resolution has been passed authorizing the paving, curbing and guttering of portions of State, 15th, 6th, 14th, 2d, Walnut, Main, Franklin, Tremont, 23d, 18th and 11th Sts.

Topeka, Kan.—About forty-five blocks of paving will be constructed this year. The streets to be paved with asphaltic concrete are: Hancock between 2d and 4th Sts.; College from 6th to 10th; Fillmore from Euclid to 19th; 7th from Buchanan to Lincoln; Broadmoor from Willow to Ashland; Willow from West to Broadmoor; Jewell from 15th to 16th; 11th from Fillmore to Lane. The streets to be paved with brick are: 7th from Jefferson to Shungununga bridge; Ashland from Greenwood to Buchanan; Van Buren from Huntington to Euclid; 9th from Monroe to Madison; Chestnut from 7th to 8th; Van Buren from 1st to 3d; 6th from Morris to west line of Melrose addition; Adams from 5th to 7th; Seward from Branner to city limits. Four alleys will be paved and brick will be used. They are: Between Polk and Taylor from 10th to 11th; between Kansas and Jackson from 5th to 6th; from Fillmore to the east line of the north and south alley between Fillmore, Western, King and Twelfth.

Topeka, Kan.—Resolution has been adopted for improving Adams St., from south line of Fifth St. to south line of Seventh St., grading, curbing with combined curb and gutter, and paving 60 ft. wide with 18 per cent. vitrified blocks on 5-in. concrete base, with grout filler. W. G. Tandy is Comr.

Barbourville, Ky.—The requisite number of signers having been obtained, election will be held March 15 to obtain sentiment of Knox county voters on issuing bonds to amount of \$200,000 for road building.

Greenup, Ky.—Greenup County votes Jan. 19 on \$200,000 bonds to rehabilitate entire road system.

Mt. Vernon, Ky.—People in county propose to put question of \$100,000 bond issue for good roads up to voters.

New Albany, Ky.—Council has adopted resolution giving formal consent of city to Board of County Commissioners to improve that part of Vincennes St. from Charleston Road to city limits. Improvement is a part of proposed improvement of Grant line road from city limits to township line.

Pineville, Ky.—Bell County votes Feb. 13 on \$250,000 bonds to construct roads, etc.

Biddeford, Me.—Construction of cement walk along beach at Old Orchard is proposed.

Baltimore, Md.—State receives bids until Jan. 5 to construct about 10.89 miles five sections, of state highway.

Boston, Mass.—To relieve the pressure of traffic on Columbus Ave., Mayor Curley has asked Commissioner Rourke of public works department to include in his annual budget sum of \$500,000 for smooth paving of Tremont St.

Clinton, Mass.—Purchase of portable stone crusher and motor is being considered.

Clinton, Mass.—Extensive repairs are contemplated on following streets: Haskell Ave., Cedar, Beech, Birch, Franklin, Greeley and Oak. Estimated cost, \$6,000.

Clinton, Mass.—Road Commissioners have voted to recommend total appropriation of \$26,500 to be applied as follows: roads, sidewalks and bridges, \$21,000; dust-laying, \$5,000, and sewer maintenance, \$500.

Gloucester, Mass.—Mayor Charles H. Barrett has recommended several permanent street improvements.

Lynn, Mass.—Mayor George H. Newhall has recommended that provisions be made for continuance of equal amount of paving each year until all streets which have car tracks are paved. For 1915, he recommends Washington St., Western Ave. and several stretches on Oxford, Mulberry, Blake, Liberty and Sutton Sts.

Melrose, Mass.—Mayor Charles Adams has recommended extension of Lynn Fells parkway to Lynn woods.

Pittsfield, Mass.—Mayor Faulkner has recommended construction of permanent road from Pomeroy Bridge on West Housatonic St. westerly to State road on Woodleigh Ave.

Pittsfield, Mass.—Mayor Faulkner has recommended paving of Melville St. and East St. Also portions of other streets.

Flint, Mich.—Question of drawing up plans and specifications for paving of 27 streets in city will be brought up at council meeting. This question was voted on and carried at last election by taxpayers of city. According to estimates as they have been given out, 110,000 sq. ft. of pavement are to be built. If everything goes through without objection, bids will probably be advertised about Jan. 27.

Flint, Mich.—The Detroit Trust Co. was successful bidder for \$64,974.31 worth of municipal improvement bonds to be issued by city to cover its share of cost of pavements to be built in 1915.

Flint, Mich.—Road bond issue of \$500,000 will be considered.

Wyandotte, Mich.—A petition for paving of Elm St. from 1st to 7th Sts. has been presented to Wyandotte City Commission. The request was referred to Commissioner Schroeder.

St. Paul, Minn.—J. H. Armstrong, County Surveyor, will ask commissioners to let contracts as soon as they can get satisfactory bids for about 21 miles of road in Ramsey County.

Aberdeen, Miss.—Monroe County awarded \$12,000 contract to grade, surface and pave 3 miles of road with reinforced concrete.

Amory, Miss.—City awarded \$15,000 contract to pave, curb and gutter one mile of street.

Joplin, Mo.—Resolution has been adopted declaring it necessary to grade, sub-grade and pave, at grade, except where already paved, alley between Wall St. and Pearl St., from 7th St. to 10th St., with Class C concrete pavement, said pavement to be 2-course concrete pavement, the first course to be 5 ins. thick, 1:6 mixture, the second course to be 1 in. thick, 1:2 mixture. Said pavement to be constructed the full width of the alley.

Omaha, Neb.—About ten miles of pavement are being planned for this year.

Hillside, N. J.—Bids for 1,500 tons of crushed stone for street repairs will be opened at February meeting. Advertisement will call for bids on two plans—one to deliver stone at West Elizabeth station of Lehigh Valley Railroad, and other to deliver stone on streets when and where needed.

Long Branch, N. J.—Bids for paving of two wings of Norwood Ave. Blvd., between Roseld Ave., Deal, to the Deal Lake bridge, have been rejected at a meeting of the County Commissioners. The bids ranged from \$22,000 to \$28,000. The bids included brick gutters as well to the present amiesite road.

Millville, N. J.—Survey of route of the proposed new State road from Millville to junction of road leading from Port Elizabeth to Mauricetown Road, is now being made, and report will be ready to be laid before Cumberland County Board of Freeholders at adjourned meeting to be held on Jan. 20.

Paterson, N. J.—Definite steps have been taken by Trenton Ave. Improvement Association to have Trenton Ave. extended from Crooks Ave., this city, to Clifton Ave., Clifton.

Good Grounds, L. I., N. Y.—For past few days surveyors have been working on main highway of village for new State road which will be started this spring. State road will start at Quogue, at junction of Riverhead state road and main road, and will go east through East Quogue, Good Grounds, across Shinnecock Hills to Southampton incorporation limit.

Herkimer, N. Y.—Eight bonds of village of Herkimer, aggregating \$3,187.36, have been offered for sale at City Hall by Village Attorney James H. Fagan. The money from bonds is to be used to pay property owners' share of cost of paving West St., and two of bonds are payable each year from 1915 to 1918.

Lowville, N. Y.—A petition will be circulated among property owners on Shady Ave. for pavement to extend from corner of Shady Ave. and State St. to depot, a distance of 1,300 ft. It is expected new State road to be constructed between this place and Croghan will go over this ground and it is proposed to widen 16-ft. road to 40-ft. pavement, in case petition is favorably received by abutting property owners.

Newfane, N. Y.—First road in town of Newfane which will receive attention next spring is Henderson Rd. The Ide Rd. west of this village and Ewings Rd. near Jaques will also be improved this year.

Peekskill, N. Y.—Board of Supervisors have passed resolution calling for expenditure of \$177,790 for highways in county this year.

Wampsville, N. Y.—About 18.70 miles of improved road is to be built by county this year.

Whitesboro, N. Y.—Permanent improvement of Mohaw St. road is urged.

Gaston, N. C.—Gaston County will vote on \$150,000 bonds to construct additional roads, etc.

Greensboro, N. C.—County Commissioners will shortly consider improving of various roads from county into Greensboro. About 15 miles is being planned.

Rutherfordton, N. C.—Rutherford County awarded contracts to grade and surface about 50 miles of roads; \$100,000 available.

Wilmington, N. C.—The three corporations interested in construction of road to Carolina Beach will accept proposal of Board of County Commissioners that former pay half expense for building a hard road to that point, county to pay other half.

Cincinnati, O.—Bids will be received at office of the Auditor of the city of Cincinnati, O., until 12 o'clock, noon, on Feb. 11, 1915, for purchase of bonds of said city aggregating sum of \$280,000 for purpose of providing funds for resurfacing, repaving and improving certain existing streets and public highways in city of Cincinnati. Wm. Leimann is City Auditor.

Cincinnati, O.—A resolution has been passed declaring it necessary to improve Morgan St., from Reading Road to Dover St., by paving with brick. Also resolution to improve Barton St. by paving with brick.

Geneva, O.—Resolution has been passed to improve Denot St. from North Broadway to North Eagle St. by grading, draining, curbing and paving with brick on concrete foundation.

Geneva, O.—Resolutions declaring it necessary to improve Eagle St. between West Main and Denot St. by paving with brick and of improving South Broadway from end of present paving to corporation line by paving with concrete have been passed.

Hamilton, O.—See "Sewerage."

Sandusky, O.—Resolutions have been adopted for improvement of various streets.

Toledo, O.—Proposed plan for extension of Summit St. has been submitted to council by John B. Friend. Resolution referred to committee of whole provides for opening street from Perry St. through to Broadway, the west side of extension coming onto Broadway at Cushing St.

Troy, O.—Following bids were received by County Commissioners for Bermudez asphalt paving: Geo. K. Moses, Troy, O., \$6,633; Myers & Cole, Dayton, O., \$6,427; Sweeney & McKee, Troy, O., \$6,736, and J. V. Hennessey & Bro., Troy, \$6,889.

Urbana, O.—One mile of macadam and concrete road will be built northwest of Urbana and Sidney pike this spring. This was decided upon by Board of County Commissioners. Road will be built for one mile starting from northern end of MacBeth hill macadam road and extending into Concord township.

Youngstown, O.—The first step to widen South Hazel St. from Federal St. to Front St. has been taken when ordinance prepared by city solicitor's office was introduced, providing for appropriation of necessary land on west side of street to widen thoroughfare 20 ft.

McMinnville, Ore.—Appropriation of \$15,000 is included in budget for improving the Grand Ponds Road.

Connellsville, Pa.—Ordinance has been passed authorizing and directing issue and sale of bonds of City of Connellsville, amounting to one hundred thousand (\$100,000) dollars, proceeds of which shall be used, first, for payment of unfunded debt of said city, aggregating approxi-

mately \$56,000, and second, for permanent improvement of streets and highways by opening, grading, paving, sewerage and otherwise, and providing for redemption of said bonds and payment of interest thereon.

Lebanon, Pa.—Paving of Lebanon St. has been ordered.

Williamsport, Pa.—Mayor Stabler has made numerous recommendations for public improvements in his annual message. The Mayor outlines paving program which includes improvement of West Fourth St., west from the Pennsylvania railroad to Cemetery St.; Cemetery St. north to Erie Ave., and west on Erie Ave. to Lycoming Creek. His chief recommendation, however, to highway department is repair of paved streets.

Woonsocket, R. I.—All bids for paving of Pond St. have been rejected by Aldermanic Committee on Streets.

Bristol, Tenn.—County Court of Sullivan county, Tenn., will ask for new law whereby it may be permitted to make new bond issue of \$100,000, to be used in completing unfinished links in its system of highways. Should this amount be issued, it would make total of \$600,000 appropriated for highways by this county.

Abilene, Tex.—City will gravel about 5,100 sq. yds. of street.

Anderson, Tex.—Grimes County road district No. 3 voted Dec. 31 on \$30,000 bonds to construct macadam, gravel and paved roads.

Anderson, Tex.—Grimes County road district No. 4 votes Jan. 2 on \$60,000 bonds to construct macadam, gravel and paved roads.

Beaumont, Tex.—Jefferson County voted \$200,000 bonds to improve roads.

Boerne, Tex.—Kendall County has voted \$25,000 bonds to construct roads in precinct No. 1.

Bryan, Tex.—Bragos county road bond election of \$600,000 has been defeated. Petition for precinct bond election is being circulated. A. B. Carson is Co. Engr.

Corsicana, Tex.—Good roads bonds in sum of \$75,000 for District No. 3 have been sold to Fred Smith of Dallas.

Ennis, Tex.—City has voted \$110,000 bonds to pave streets.

Floresville, Tex.—Wilson County, districts Nos. 2 and 3, voted \$13,000 and \$18,000, respectively, for road improvements.

Greenville, Tex.—Hunt County road district No. 1 will construct proposed highway system; \$400,000 available.

McKinney, Tex.—City will pave 1.6 miles of streets.

Paris, Tex.—In election held to authorize issuance of additional bonds to amount of \$200,000, half of it for continuation of street paving and other half for erection of additional school buildings and improvements, both propositions have been carried by large majorities.

San Angelo, Tex.—Improvement of some of unpaved streets of city is being considered.

San Marcos, Tex.—Bids are being asked for construction of National Post Rd. which has been surveyed through Hays county.

Bland, Va.—Bland County, Sedden magisterial district, votes Feb. 16 on \$30,000 bonds for road and bridge improvements.

Fredericksburg, Va.—Stafford County will receive \$5,000 additional from Richmond-Washington Highway Association toward work on road from Richmond to Washington, which makes total appropriation of more than \$12,000 from that source for county. The sum, with work of convict force, will suffice to complete road from Chappawamsic Creek, the dividing line between Stafford and Prince William, to Fredericksburg.

Richmond, Va.—The Administrative Board has directed City Engineer Bolling to advertise for bids for curbing and guttering along both sides of streets south of Ashland St. and east of Davis Ave., adjoining Ryd Park.

Parkersburg, W. Va.—City will vote in March on \$200,000 bonds to construct streets, etc.

Chehalis, Wash.—The Lewis County Commissioners have decided to pave unfinished portion of Pacific highway between Chehalis and Centralia next summer. Distance is trifle more than a mile. Road which will be constructed on present high grade, will be widened and paved portion will be about 18 ft. and of concrete. Estimated cost is \$15,500. Bids for this work will be opened Feb. 6. This connection will give almost continuous stretch of paved road by

next fall between and through Chehalis and Centralia and to points beyond, each of them amounting to fully 10 miles. Besides this section, one additional mile is to be built next summer across Cowlitz prairie toward Chehalis, making a 2½-mile stretch leading northward from Toledo on Pacific highway toward this city. Also one mile and 600 ft. will be added to the 16-ft. paved concrete roadway southeast of Chehalis. This work will aggregate about \$32,000, bids to be opened early in February also.

Seattle, Wash.—City Council has ordered the improvement of various streets.

Milwaukee, Wis.—Proposition is being considered to perfect a system of improved highways through state from Milwaukee and other southern points to Lake Superior. A route has been outlined from Milwaukee to Ashland, via Fond du Lac, Oshkosh, Neenah and Menasha, Appleton, Waupaca, Stevens Point, Marshfield and thence following the old Wisconsin Central railway to Ashland. The sandy soils of Waupaca and Portage Counties are proposed to be given improvement, perhaps with oil. In Lake Winnebago region roads are good and will be made excellent by another year. Stretch from Milwaukee to Fond du Lac needs a large amount of attention to make it a good road for rapid travel.

CONTRACTS AWARDED.

Los Angeles, Cal.—By Board of Public Works for improvement of alley northwesterly from Spring St., from the southwesterly line of 8th St. to the northeasterly line of 9th St., and a portion of 9th St. to Fairchild-Gilmore-Wilton Co. at following bid: 20 cts. per sq. ft. for asphalt paving, Specifications No. 96; 20 cts. per sq. ft. for asphalt repaving, Specifications No. 96; 40 cts. per sq. ft. for granite block gutter, Specifications No. 71; \$3,000 for concrete retaining wall, complete, Specifications No. 87.

Los Angeles, Cal.—By Board of Public Works for improvement of Vernon Ave. to Geo. H. Oswald at following bid: 16½ cts. per sq. ft. for asphalt paving, Specifications No. 96; 30 cts. per lin. ft. for cement curb, Class A, Specifications No. 88; 45 cts. per lin. ft. for steel-faced cement curb, Class A and Special, Specifications No. 88; 10 cts. per sq. ft. for cement sidewalk, Specifications No. 84; 40 cts. per sq. ft. for granite block gutter, Specifications No. 71; \$540.50 for reinforced concrete culvert at Ascot Ave., complete, Plan No. 27126, Specifications No. 87; \$558.95 for reinforced concrete culvert at McKinley Ave. (proposed) complete, Plan No. 27128, Specifications No. 87; \$60.25 for reinforced concrete culvert at Wall St., complete, Plan No. 27125, Specifications No. 87.

Pomona, Cal.—For paving 9.5 miles of streets by Mayor to Crandall Constr. Co. at about \$150,000.

Wilmington, Del.—For constructing new brick pavements, sidewalks and curbs around new joint building by Building Comm. to P. H. Kelley, Philadelphia, at \$8,897 and \$6,500 respectively.

Titusville, Fla.—For paving with Cquina rock to B. Akerman, Titusville, at \$5,133.62. Also \$600 additional for 385 ft. 24-in. terra cotta storm sewer.

Fowler, Ind.—Contracts for five roads in Benton County have been let. Action on proposed \$30,000 concrete road in Grant Township has been delayed by Viewers, who postponed submitting their report until Jan. 15. There were 18 bidders for five roads that were let. Roads and successful bidders, and amount of their bids follow: Welch Road, which are certain streets in the town of Fowler, awarded to William Mahoney, of Lafayette, at \$5,666. Mr. Mahoney also was the successful bidder for the Kieffe Road in York Township, which sold at \$6,281. Glynn & Van Natta, of Otterbein, were awarded the Burns Road in Bolivar Township at \$6,400. Evans & Van Natta will build the Phares Road in Oak Grove Township for \$8,850, also the Lowman Road on the township line between Grant, Richland and York Townships, the latter road for \$11,250. All five roads are to be built of stone.

Monticello, Ind.—For paving Thomas Tolen gravel road to Spencer & Unroe, Wolcott, Ind., at \$12,885.

Muncie, Ind.—County Commissioners have awarded contracts for construction of Henry G. Morris Road in Union Township and David E. Brammer Road in Delaware Township to Frank Hines, contract price being \$4,440 for Morris highway and \$6,440 for Brammer Road. Board has ordered Stephen O. Thomas, Ander-

son Woodring and William Richey Roads in Harrison Township sold on Feb. 3. The Pittenger Road in Delaware Township also will be sold at that time.

Newcastle, Ind.—For constructing County line highway, by Comrs. of Henry, Fayette and Rush Counties, to Hoppes & Johnson, Anderson, Ind., at \$13,864.

Peru, Ind.—Ray N. Sullivan, well known road contractor of this county, has been awarded contract for restoning of 6½ miles of old Michigan road through Fulton. Contract price is \$34,997.50. Contract was awarded by Fulton County Commissioners at Rochester.

Portland, Ind.—For paving with crushed stone, 1¼ miles, contract has been awarded to Robinson & Shultz, Pennville, Ind., at \$5,470.

Rochester, Ind.—For constructing two gravel roads by County Commissioners to McTuenan Bros., Elwood, Ind., at \$29,748.

Middleboro, Ky.—For paving number of streets in Middleboro by City Council to Carey-Reed Constr. Co. Estimated cost, \$100,000.

Covington, La.—By St. Tammany Parish Police Jury, to Arthur Dotten, Houltenville, La., at \$24,068, for construction of road to Pearl River.

Baltimore, Md.—By state roads com., to American Paving & Contracting Co., Montebello Ave. and Baltimore & Ohio R. R. (lowest bidders), at \$22,778, to pave Cathedral St. from Madison St. to Mt. Royal Ave. with sheet asphalt, and to Betz & Boyce, of Albany, to construct Annapolis Blvd. from Glenburnieto Pumphreys Station, 3¼ miles, with macadam or concrete. Bids for macadam is \$38,730, and for concrete, including grading and concrete culverts, \$42,272.

Boston, Mass.—For bituminous macadam roadway in Intervale St., between Columbia Rd. and Normandy St., following bids were opened Dec. 28, 1914, at 12 o'clock noon: J. C. Coleman & Sons, Co., \$6,441.90; Martino De Matteo, \$6,540.94; John F. Beatty, \$6,591.73; James Doherty, \$6,643.25; John Landis, \$6,968.83; John Kelly Co., \$7,020.40; Hugh J. McGuire, \$7,398.13; Peter Bompiani Co., \$9,782.15. Contract was awarded to J. C. Coleman & Sons Co. Engineer's estimate, \$7,467.

Crystal Falls, Mich.—For constructing 10¼ miles of earth road of Beechwood Gogebic County Road to Hicks & Barber, of Vulcan, Mich., at \$29,951. Other bids as follows: A. D. MacRae, Pentoga, Mich., \$30,876.70; Smith, Byers & Sparks Co., Houghton, Mich., \$36,175.05; Wydell Co., Mankato, Minn., \$29,671.10; Oxman & Son, Ironwood, Mich., \$31,940.75; Gust. Fredeen, Norway, Mich., \$42,429.50; C. C. Nutler, Virginia, Minn., \$41,281.50; McGrath & Sons Co., Green Bay, Wis., \$31,470.80, and Boyle & Co., Crystal Falls, Minn., \$31,565.50. A. L. Burridge is County Road Engineer.

Jackson, Miss.—To Barber Asphalt Paving Co., at \$0.10 per gal. for asphalt, to Birmingham Coal & Lumber Co., \$2.40 per cu. yd. for screenings, and to T. J. O'Farrell, at \$0.65 per cu. yd. for sand, for resurfacing Capitol St. Work will be done by day labor.

Duluth, Minn.—The Road Construction Co., of Grand Rapids, Wis., has submitted lowest bid to County Board for construction of five miles of Agnew Road which will connect Swan Lake Road with Meadowlands district. Its bid was \$8,895, and it is expected that contract will be let to this company. There were seven other bidders.

New Brunswick, N. J.—By Board of Freeholders for paving of Schalks' Corner Road, near Cranbury, to H. N. Scott & Co., at \$17,191. The lowest bid from the Monmouth Construction Co., \$13,959.50, contained numerous errors and was rejected.

Long Island City, L. I., N. Y.—For paving contracts have been awarded as follows: Repaving roadway and constructing pile and timber bulkheads in Rockaway turnpike from New York Ave. to Hook Creek, South Jamaica, to Public Work Contr. Co., Long Island City, at \$12,130; grading, curbing and laying sidewalks in Hancock St., Long Island City, to J. Di Nienna, at \$10,543.

New York, N. Y.—To F. D. Cummer & Son Co., Cleveland, O., at \$5,995, for construction of portable asphalt plant for Borough of Bronx.

Syracuse, N. Y.—Three paving contracts have been awarded by Board of Contract and Supply. The Warner-Quinn Company got the contract for resurfacing pavement in South State St. from Erie canal to East Onondaga St., at \$9,883.50. Present pavement is brick, but asphalt was designated for resurfac-

ing. F. J. Baker was given contract for paving Almond St., from Madison to East Adams St., at \$10,138.50, and Hugh Mulherin contract for paving Henderson St., from Oak St. to its western terminus, at \$2,670.55.

Yonkers, N. Y.—To Warren Bros., Boston, Mass., for paving Lawrence St., at \$15,918.

Minot, N. D.—For graveling roadway about 1,284 cu. yds. to Benj. McDonnell, Minot, N. D., at \$1,219.80.

Cincinnati, O.—For paving of Stratford Ave. with brick, to Henkel & Sullivan, Cincinnati, O., at \$3,646.25, and Corbett Ave. at \$5,582.80.

Columbus, O.—Following is tabulation and results of bids received at letting on Dec. 11, 1914. Brown county, on Sec. B, of the Georgetown-Wilmington Rd., I. C. H. 175, in Green Township, for constructing the bridge culverts, grading roadway and paving with waterbound macadam. Length 15,710 ft., or 2.98 miles. Width of pavement 14 ft., width of roadway 26 ft. Estimated cost of construction, \$31,385.84: Stratton & Evans, Hamersville, O., \$31,180.84; The Ironton Transfer & Storage Co., Ironton, O., \$31,061.99; Thurber & Browning Co., Cincinnati, O., \$30,850. Contract awarded to Thurber & Browning Co., Cincinnati, O. Butler county, on Sec. "G," of the Cincinnati-Hamilton Rd., I. C. H. No. 39, in Fairfield Township. For construction of bridges and culverts, grading roadway and paving with brick. Length 14,786 ft., or 2.99 miles. Width of pavement 16 ft., width of roadway 26 ft. Estimated cost of construction \$59,939.10: Wm. L. McHugh, Springfield, O., \$59,900; Yount & Jackson, Dayton, O., \$58,998; Frank J. Stamm & Son, Hamilton, O., \$58,996; C. C. Ummel & Son, Trenton, O., \$58,490; Garver & Wirtz, Hamilton, \$57,470.42; L. A. Dillon, Hamilton, O., \$53,097. Award withheld. James R. Marker is State Highway Commissioner.

Troy, O.—For paving Walnut St. about 5,193 sq. yds. with bituminous macadam to J. M. Hennessey & Bro., Troy, O., at \$1.24 per sq. yd. or total of \$9,449.82. Bid was based on Montezuma asphalt filler and lima stone. Other bids as follows: Yount & Jackson Co., Dayton, O., at \$1.44, or total of \$11,332.77; Bigler Bros., Middletown, O., \$1.42½, or total of \$10,739.23; Sweeney & McKee, Troy, O., \$1.30, or total of \$9,815.68; John Wroe, Dayton, O., \$1.18, or total of \$9,190.88. M. A. Goutz is City Engineer.

Eugene, Ore.—E. T. Johnson, of Portland, has been awarded the contract to build grade of about 20 miles of Pacific highway between Hornbrook and Yreka, Cal., and is shipping his outfit from Wendling through Eugene to scene of operations.

Aiken, S. C.—To H. P. Dyches and B. F. Holley, city, for construction of portion of Aiken county post road, which will be built by U. S. Government, for about \$11,500.

Corpus Christi, Tex.—Contract for macadam road surface across causeway has been awarded to W. L. Pearson & Co., thus making entire contract to be executed by that firm at contract price of \$154,000.

Dallas, Tex.—Contract for laying sidewalks on north side of Elm St. and on St. Paul in street widening district has been awarded to Dallas Paving Co. by Board of City Commissioners at company's bid of 0.97 cts. per sq. ft.

Fort Worth, Tex.—By city, to Roach & Manigan Paving Co., of Fort Worth, at about \$235,000 for 100,000 sq. yds. asphaltic concrete paving.

Galveston, Tex.—By city, to P. J. Voutrin, at \$3,013, to pave alleys with brick between Aves. F and G from 22d to 24th St., and between Aves. E and F from 20th to 21st St.

Galveston, Tex.—Letting the contract for supplying maintenance shell for county roads was chief matter of business coming before Board of County Commissioners. Quantity for which bids had been invited was not over 10,000 cu. yds. for use on county mainland, 200 yds. for Port Bolivar, 800 yds. for Bolivar peninsula outside of Port Bolivar, and 2,000 yds. for island roads. Bids were as follows: W. D. Haden, mainland 65 cts. the cu. yd., Port Bolivar 62 cts., Peninsula 69 cts., Galveston Island 62 cts.; Hanson's Sons, mainland 72½ cts., Port Bolivar 72 cts., Peninsula 80 cts., Island 64 cts. F. Freund bid for the Island shell only, 77 cts. On motion of Commissioner Deats the contract was awarded to W. D. Haden as lowest bidder.

Mount Pleasant, Tex.—City Council has signed contract for paving of 10 blocks, which includes main business part of city by Bert Hahn Construction Co. of Dallas. Amount to be spent in work will be about \$30,000. Work is to begin on paving in 30 days and job is to be completed within four months. Oklahoma rock asphalt is to be used in the work.

Sherman, Tex.—Sherman has let contract for approximately four more miles of street paving. Contract was let to Levy & Levy of Muskogee, Okla. Streets to be paved under new contract are West Lamar St., from the west side of the square to Birkley St.; East Lamar St., from Walnut St. to Grand Ave.; North Walnut St., from Brockett St. to the Robert E. Lee School Bldg.; also all of the "skips" on Brockett, Mulberry, Walnut and Houston Sts., thus taking care of all spots on those thoroughfares which have not heretofore been paved. Paving is to have a 5-in. gravel concrete base with a 5-in. Texaco asphalt topping. Work is to be commenced within 30 days.

Seattle, Wash.—For paving shoreland Drive, to Elliott Construction Co., at \$6,673.59.

Westport, Wash.—To Christensen & Paugh, Hoquiam, Wash., at \$9,153, for paving work amounting to about 3,200 lin. ft.

SEWERAGE

Los Angeles, Cal.—Construction of various sewers has been ordered.

Ontario, Cal.—City Clerk R. O. Brackneridge will receive bids until Feb. 1 for sewer bonds in sum of \$55,000.

Wilmington, Del.—City Council will probably decide at meeting with Street and Sewer Department to ask the Legislature for bond issue of \$400,000 for street and sewer work.

Richmond, Ind.—Councilmen favor \$150,000 bond issue for necessary improvements. Following is list of same: Sewer Lines—Between W. 9th and 11th, \$500; Randolph St. from river to W. 5th, \$12,000; N. 2d and A Sts., \$1,200; Main, from 11th to 12th, \$500; South End relief sewer, \$50,000; North E and 24th relief sewer, \$10,000; enlarging filter beds, Southwest sewer system, \$1,500. Street Paving—N. 9th, from Main to A, \$2,400; N. 16th, from Main to North F, \$5,600; North A, from 7th to 16th, \$12,400; N. 5th, from Main to North A, \$1,500; N. 3d, from Main to North D, \$3,000; Sheridan St., from Richmond Ave. to School, \$4,800; N. 15th, from E to F, \$1,500; North F St., from 15th to 16th, \$800; widening N. 3d at C & O., \$5,000. Crossing Subway—Under Pennsylvania tracks at N. 12th St., cost to city, \$40,000.

Baltimore, Md.—Following are bids received on Sanitary Contract No. 145, covering Section 7, West Low Level Interception: Smith & Ruggles, Baltimore, Md., \$29,754.25; M. O'Herron & Son, Baltimore, Md., \$30,175.45; Ryan & Reilly Company, Baltimore, Md., \$30,314.75; Jas. Ferry & Sons, Baltimore, Md., \$34,858.40; Carranza Bros. & Co., Baltimore, Md., \$39,252.30. Calvin W. Hendrix is Chief Engineer.

Clinton, Mass.—See "Streets and Roads."

Duluth, Minn.—Ordinance introduced by Commissioner Murchison authorizing appropriation of \$450 for construction of cut-off sewer from sewer between Gladstone St. and 48th Ave., east, has been given its first reading.

Omaha, Neb.—Efforts will be made to secure permission from legislature to permit voting of about \$200,000 in additional sewer bonds to permit completion of much needed sewerage, including extension of Saddle creek sewer.

Camden, N. J.—City will construct following sewers or drains in and along Van Buren street, from Ferry avenue to Vanhook street; Ninth street, from Wright avenue, to Newton avenue; Eighth street, from Vanhook street to Ferry avenue, and Central avenue, from Seventh street to Ninth street, and Philip street, from Central avenue to Ferry avenue. A. L. Sayers is Street Commissioner.

North Wildwood, N. J.—Bond election will be held Jan. 12 for voting on \$35,000 bond issue for sewer system extension. G. A. Redding is Borough Clerk.

Binghamton, N. Y.—First steps in construction of sewage disposal plant for city are being taken by City Engineer John A. Giles and force of assistants. Lines are being run in different parts of city to obtain necessary levels for intercepting sewers and such lateral sewers as may be necessary to complete the system. An expenditure of \$500,000

probably will be required to purchase site, install the plant, build the interceptors and complete the system. An effort will be made to induce state to pay part of cost for treating sewage from State Hospital which will reduce expense to local taxpayers.

Cincinnati, O.—Ordinance has been passed providing for issue of bonds in sum of \$1,500 for purpose of providing funds to pay city's portion of cost and expenses of construction of sanitary sewer system in District No. 2 in former village of Kennedy Heights.

Dayton, Ohio.—City Commission is considering issuing \$40,300 in bonds for constructing sewers in Berm, Grafton, Norman and Wyoming Sts., and Burton Ave.

Hamilton, O.—It has been determined to proceed with paving and sewerage, storm and sanitary, where necessary, on following streets: Grand Blvd., from East Ave. to Parish Ave.; N. 2d, from Black to 3d St.; Shuler Ave., from Hancock to Lincoln Ave.; 8th St., from High to Vine St.; 9th, from High St. to the reservoir; Buckeye, from 4th to 11th, and the unpaved portions of 6th and 7th Sts. It was also determined to construct following sewers preparatory to paving: Storm and sanitary sewers on C and Jackson St. south; storm and sanitary sewers on Linden and Madison, from Symmes to Williams Aves.; storm sewer on Monument Ave., from Ludlow Ave. to Chestnut St.; North B, from Black St. to the north corporation line, and also pave the roadway; Progress and Sherman, from Park to Elvin Ave., and also pave same; storm sewer on Parish Ave., with grading and graveling.

Hamilton, O.—City Civil Engineer F. E. Weaver has submitted plans for construction of various sewers in East Hamilton and Lindenwald, estimated cost of which was as follows: District No. 1, \$22,850.50; District No. 2, \$24,731.20; total, \$47,581.70. Received.

Marion, O.—Ordinance has been passed for construction of sanitary sewer and storm water sewer in Park St., and various other streets.

Massillon, O.—Probable cost of building sanitary sewer on Ohio St., from Akron to Mill Sts., has been estimated at \$1,300 by engineering department. It was referred to sewer committee.

Newark, O.—Ordinance has been passed for improvement of Clarendon St., from Buena Vista St. to Cedar St., by construction of sanitary and drainage sewer.

Norwood, O.—Ordinance has been passed to issue bonds for building of storm water sewer for ravine between McNeill and Carter Sts., bonds amounting to \$1,000.

Toledo, O.—Ordinance has been adopted for construction of main sanitary sewer No. 13, in subdistrict No. 1, of Lucas County.

Youngstown, O.—County Commissioners have passed resolution to appropriate necessary property for pipe lines and disposal plant of Pleasant Grove District sewer, which will drain northern half of Boardman Township and will benefit many plants that have been opened. Disposal plant will be located on Mill Creek near Shields bridge. Cost of system will be met by sale of \$46,000 in bonds.

Afton, Okla.—Election has been called for Jan. 21, 1915, by the Board of Trustees to vote on question of issuing bonds in amount of \$37,000 for construction of sanitary and storm sewer system. The Benham Engineering Co., of Oklahoma City, Okla., are consulting engineers for the town.

Portland, Ore.—City Auditor Barbur has been directed by council to readvertise for bids for construction of Willow and E. 82d st. branch of East Stark St. district sewer.

Allentown, Pa.—Council has purchased a site for sewage disposal to cost about \$100,000. Charles D. Weirbach is City Eng'r.

Charleston, S. C.—Dr. T. Grange Simons, chairman of Sewerage commission, has stated that Commission was contemplating plans for extension of sewerage system to northwestern portion of city, and also along Boulevard. No definite plans or arrangements have been made as yet, as additional surveys will be necessary. Should contemplated plans of Commission materialize it is estimated that approximately \$40,000 will be spent on the Hampton Park extension and about \$25,000 on Boulevard extension.

Aberdeen, Wash.—Lewis D. Kelsey, City Eng'r., is preparing plans for construction of trunk sewers in Sumner, Jeffries,

Martin, Duffy and other streets; estimated to cost \$40,000.

Milwaukee, Wis.—Mr. T. Chalkly Hattson, Chief Engineer, Sewerage Commission, announces that surveys have been made and plans prepared for construction of an intercepting sewer on each side of Milwaukee River. Proposals will doubtless be invited in the next few weeks.

Superior, Wis.—Because they were too high, bids for construction of sewer between Catling and Fisher Sts., from Broadway to 14th St., were rejected by Board of Public Works.

CONTRACTS AWARDED.

Blytheville, Ark.—For sewer work, to A. C. Brooks, Birmingham, Ala., at \$54,200.

San Francisco, Cal.—Karl Ehrhart has been given contract for constructing sewer on Nineteenth ave., Noriega st. and Twentieth ave. for \$49,984.50.

Louisville, Ga.—By city, to Macon Engineering & Construction Co., Macon, Ga., to install sewer system and extend water system.

Fort Wayne, Ind.—For brick or segment block sewer to S. L. Sheets Const. Co., South Bend, Ind.

Iowa Falls, Ia.—To Moore & Moore, Waterloo, Ia., contract at \$23,828.16 for sewer in Districts 15 and 16.

Keokuk, Ia.—To Keokuk Quarry & Cons. Co., for construction of 8-in. sanitary sewer through alley in Block 20.

Baton Rouge, La.—To Nye Odorless Crematory Co., Macon, Ga., at \$4,700, for installation of garbage incinerator.

Boston, Mass.—For Dent St. Brook conduit in private land and Pleasant St., between Roberts Ave. and La Grange St., and in La Grange St. and Chapin Ave., West Roxbury, following bids were opened Dec. 31, 1914: Merrimac Const. Co., \$25,466.35; West Roxbury Trap Rock Co., \$25,757.70; Peter Bompiani Co., \$28,007.67; James J. Conway, \$29,272; Henry Spinach Contr. Co., \$30,506.85; McCarthy & Walsh, \$30,779.45; Michael Meehan, \$30,946.35; M. De Sisto, \$31,526.77; Anthony Baruffaldi, \$32,156.55; John Landis, \$32,236.76; Charles Latorella, \$33,494.70; Martino De Matteo, \$33,758.42; Antony Cefalo, \$33,894; Wm. J. Barry, \$34,169.50; Peter W. Hill, \$34,170.75; Jas. Driscoll & Son Co., \$35,028.55. Contract was awarded to Merrimac Construction Co. Engineer's estimate, \$34,851.05.

Duluth, Minn.—To A. Hedenberg, contract for construction of sanitary sewer in 52d alley between Ramsey and Polk sts. for \$2,722.

Syracuse, N. Y.—Contract for constructing system of storm water sewers in First and Second wards has been awarded and final payments ordered on two other contracts by Syracuse Intercepting Sewer Board. Proposals for sewers were received August 20, the C. T. Hookway Construction Company being lowest bidder, at about \$60,000.

Syracuse, N. Y.—Contract for sewer in Allis St., has been awarded to Antonio Mondo at \$899.50.

Canton, O.—By Director of Pub. Service, for construction of main sewer to sewage disposal plant, in 3 sections, to J. F. Casey Co., Pittsburgh, Pa., on American Sewer Pipe Co.'s 39-in. segment block with concrete siphons, brick manholes and blowout chambers. Following are unit prices of the J. F. Casey Co., the successful bidder: Sect. 1—10,931 lin. ft. 39-in. segment block sewer, \$3.80; 200 lin. ft. 39-in. combination segment block and reinforced concrete gravel construction, \$17.37, and 168 lin. ft., at \$15.71; 239 lin. ft. for each vert. ft. of M. H. built with brick walls, \$5.45; total cost, 39-in. segment block gravel or stone, concrete construction, \$49,657. Sect. 2—8,900 lin. ft. 39-in. segment block sewer, \$3.75; 179 lin. ft. vert. ft. of M. H. built, brick walls, \$4.84; total cost 39-in. segment block, gravel or stone, concrete construction, \$52,511. Sect. 3—6,007.5 lin. ft. 39-in. segment block sewer, \$4.34; 100 lin. ft. 39-in. com. segment block and reinforced concrete sewer, gravel, \$18.53; 169 lin. ft. vertical ft. manholes, brick walls, \$6.09; 2 constructing blowout chambers, \$61.74; 4,000 lin. ft. 6-in. vitr. pipe, subdrain, 20 cts.; excav. per cu. yd., \$2; total cost 39-in. segment block sewer, gravel or stone constr., \$73,812. W. E. Sarver, City Eng'r.

Binghamton, Tenn.—By town, to J. W. Blake, at \$3,000, to extend sewer and water systems.

Salt Lake City, Utah.—For sewer extension No. 336, contract was awarded to W. M. Gibson, Grand Junction, Colo., at \$57,892.58. Itemized bid as follows: ex-